

PREVENTING ANOTHER MH370: SETTING INTERNATIONAL STANDARDS FOR AIRLINE FLIGHT TRACKING

HEARING BEFORE THE SUBCOMMITTEE ON TRANSPORTATION AND PUBLIC ASSETS OF THE COMMITTEE ON OVERSIGHT AND GOVERNMENT REFORM HOUSE OF REPRESENTATIVES ONE HUNDRED FOURTEENTH CONGRESS

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Wednesday, February 25, 2015,

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON TRANSPORTATION AND PUBLIC
ASSETS,
COMMITTEE ON OVERSIGHT AND GOVERNMENT REFORM,
Washington, DC.

The subcommittee met, pursuant to notice, at 9:35 a.m., in room 2154, Rayburn House Office Building, Hon. John Mica (chairman of the subcommittee) presiding.

Present: Representatives Mica, Duncan, Amash, Duckworth, and DeSaulnier.

Also present: Representative Price.

Mr. MICA. Good morning. I would like to call this hearing of the House Subcommittee on Transportation and Public Assets, Subcommittee of Government Oversight and Reform Committee, to order.

Welcome, everyone, this morning. We are pleased to have everyone with us, especially our ranking member. Congresswoman Duckworth is with us for her first hearing. Congratulations to her on arrival of her daughter and getting through her maternity leave and rejoining us here. I know she has been back a little while, but this is her first hearing with us, and I was delighted to hear when she was selected to be the ranking Democrat member on this important subcommittee and look forward to working with her. In just a minute, too, I will recognize her for an opening Statement, but we are very pleased to have you. I think we will have a very productive 2 years working together.

But, again, welcome, everyone. The title of today's hearing is Preventing Another Malaysia Air 370: Setting International Standards for Airline Flight Tracking.

The order of business today will be, we will start with opening Statements, and usually the order is the chairman, the ranking member, other members who wish to be heard. Today we have sort of dueling hearings; there must be 10 of them going on right now all at the same time, so we will have members who may come and go or who want to be part of the hearing. We also are joined by Congressman Jimmy Duncan, and I think Mr. Price may be joining us, and we will have unanimous consent for those joining us who aren't on the committee or the subcommittee to participate at the appropriate time.

So, with that, after opening Statements, we will turn to our panel of three witnesses and welcome them this morning. I will introduce them, I will swear them in and hear their testimony, and after we hear from all three, then we will go to questions. So that will be the order of business today.

So, with that, my opening Statement. Let me begin.

At today's hearing we are going to look at recent work between international and domestic entities to close the tracking gap, as well as discuss future advancements in technology that will result in real-time tracking that can immediately alert authorities to any abnormalities during the flight of a commercial passenger aircraft.

Let me say at the outset it is absolutely unacceptable that today we are unable to locate or properly track a commercial passenger aircraft. Today it is unacceptable that any passenger aircraft with 239 people cannot be located in an accident that occurred some time ago. So I believe that it is our responsibility to ensure that no commercial aircraft with passengers should be allowed to fly without a working and operable aircraft tracking device, and today's hearing will focus on where we are in that process.

There are great implications to the problem of not being able to track aircraft even after an accident. But also now, when I visited ICAO and met with some of their officials, one of the concerns they expressed is the expansion of the international conflict zone; to date, a couple years ago, fairly limited in some of the Middle Eastern States. Now it is greatly expanded over continents, over regions, and commercial passenger aircraft are flying in these areas. We should be able to know where they are.

We are going to address today the shoot-down of another passenger aircraft. But if we don't take steps to know where an aircraft is at all times and properly route them against danger, not just know where they are when they are lost, there will be consequences; and I predict that there will be additional shoot-downs of passenger aircraft because we don't have these systems in place.

A required and working global aeronautical distress and safety system standard is long overdue. Last year, after Malaysia Air 370, we had a hearing in the Transportation Committee. A number of issues were brought up that we had to address. One that I cited back then and brought attention to the committee and the Congress was the need for action in getting, again, tracking capability of passenger aircraft. This, I might remind everyone, is 2015, and the technology exists, the capability exists. What we are lacking is a standard for all of these operating passenger aircrafts across the globe.

I was very pleased to meet last year with Michael Lawson. He is the United States Ambassador to ICAO. Upon our very first meeting, we discussed this issue and he is with us here today. Most folks don't know what ICAO is. I was explaining it to staff. When I became chairman of aviation in 2001, I didn't know what ICAO is, but ICAO is the primary and principal international aviation organization responsible for setting aviation standards, requirements, and protocols. That is for all aircraft flying across the globe.

We have 191 nations who belong, and, if you visit their headquarters in Montreal, I think it is bigger than the United Nations operation in New York City. Every country sends Ambassadors to

ICAO representatives. They have a general assembly and then they have different layers of governance, and they set the standards for all aircraft.

We have with us today Congressman Duncan, and he, with Mr. Price, has introduced U.S. legislation, and I have a copy of their legislation, H.R. 772, which actually, having read it just in the last day or so, it complies with the standards or refers to the standards as set by ICAO to require certain standards that the U.S. aircraft adopt; and we will turn to him for a better explanation shortly. But even if we can't pass this U.S. law without having the ICAO standards, American passengers could be protected, say, domestically with a domestic commercial flight if we passed it for the United States. But once they get outside our borders, ICAO has the primary responsibility for standard setting.

I have worked with IATA and met with their representatives, a very responsive international transport association, and that is an airline organization. They can set standards for their airlines, but they don't set the global standards, and they can require compliance of their membership. So that is why it is important for ICAO to act.

Interestingly enough, you may not know this, but the United States provides about 25 percent of the funding for ICAO, so we have an important stake there. We have a great representative who has been working with folks. And not too long ago, when I traveled to Montreal, arranged a meeting with the president of ICAO to express our concerns, on behalf of Congress, of adopting that standard, moving that process forward.

If we sometimes think that Congress or the Senate is slow, sometimes the international organizations, getting 191 countries to agree, that can also be a time consuming, difficult process, but I can't say that we could have had better representation than our Ambassador has given us to that organization, or better cooperation.

And I want to, today, hear an update. There was a recent meeting and I believe today we are going to have an announcement on some of the standards being proposed that just were released. We may hear more about the status of that. I think it is in draft. And then the important thing is the timeframe for implementation.

The fact is the technology does exist. The fact is the technology is on most aircraft. What is lacking is a standard. There is an opportunity, I think Mr. Duncan's bill provides for it, for enhancing some of the capability of the technology.

I met with Mr. Hart, NTSB, and we will hear from them shortly. They are working with the industry to try to come up with a tracking device that is not only more reliable, but also has a longer life and a better ability to track, and we will hear the status of that.

The long-term solution is, again, switching from a radar base to next generation air traffic control with global and GPS tracking so we know where every aircraft is that has passengers at every point on the Earth at all times, both for in the case of an accident and then also keeping the passengers safe in some of the zones I talked about that pose great risk.

So we will learn today the status of the adoption of these international standards. We will look at the requirements for potentially

longer life tracking devices and better technologies. We will hear from NTSB and others, the industry also who have comments on standards should be set that are reasonable and workable and implementable as soon as possible.

So Flight 370, although a tragedy with a loss of life of 239 individuals, from that horrible experience and still today not being able to locate that aircraft or those victims, we have a responsibility to move this process forward. Today there are approximately 90,000 flights around the world. The FAA estimates there are around 123,000 U.S. citizens boarding those planes every day, so while we can control domestic traffic and U.S. aircraft, it is important that international standard be there. We are looking at not just protecting citizens around the world, but our responsibility to U.S. citizens.

Right now the international standard is to check every 30 minutes when outside of radar. Of course, the long-term is next generation air traffic control, but listen to this. At 35,000 feet, a Boeing 747 has a cruising speed of 570 miles per hour. In 30 minutes, a plane can carry nearly 400 passengers, can travel nearly 300 miles before anyone knows where it is. That is not an acceptable standard today.

So today we are going to look at, finally, the work between international, domestic entities, the industry, some of our safety organizations, and we will hear where we are, where we need to go, and how we need to get there.

So, with that lengthy opening Statement, you will find that sometimes I use the chairman's prerogative, which I also always extend to the minority. I have often told my staff that whatever time the other side of the aisle needs, they are going to get, even if it requires that we get Preparation H and sit here forever. That is an inside joke.

Welcome, Ranking Member Duckworth. Congratulations, and look forward to working with you. You are recognized.

Ms. DUCKWORTH. And I thank the chairman. It is a joy to be here and I was especially pleased to see that you were the chairman of the committee, with your experience in transportation issue.

So I get to have my first hearing back in Congress from maternity leave on an issue near and dear to my heart, which is airspace issue. I have flown as a pilot myself on four different contingents; I have flown in Egypt, I have flown in Guyana, Iceland, and, of course, the United States, and I found airspace and the control of that airspace to be very different in each of those areas depending on the sophistication of the system, the capabilities of the host governments in that area.

So I again would like to thank the chairman for holding this hearing today. The hearing is critically important to determine what steps are being taken to improve the tracking of commercial international flights to ensure that all flights can be tracked in the event of an emergency.

With Malaysian Airlines Flight 370's disappearance after almost a year of what was the most expensive search operation in aviation history, the aircraft still has not been located, and I find this event to be especially tragic and upsetting. First, of course, our hearts,

all of us, go out to the families of the 239 people that lost their lives. Not only did they lose a loved one, but they have been denied any level of closure because the aircraft and even its remnants have yet to be found. I can only imagine the pain these family members feel and continue to suffer each and every day.

In addition to the disappearance of MH370, the weaknesses of international flight tracking system has become very visible. Again, as a pilot, as a frequent flier, Member of Congress, O'Hare is my eastern border. I don't actually have O'Hare Airport in my district. Well, I have the fence and the grass where the geese that get in the flight path land and hang out, but I don't have the gift shops or any of the revenue-generating portions of O'Hare.

I find it unacceptable that in 2014 an aircraft can go completely missing for such an extended period of time without any answers or explanations. With all the technology available to us, with GPS satellite phones, the public wants to know how can this happen in 2014. Pilots understand it a little bit better, but for the general public, they don't understand, and these are people getting on airliners and entrusting that the system will be safe to carry their loved ones to their destination.

Today I hope to receive some answers. Our witnesses include organizations that have been on the front lines of improving flight tracking systems, as well as creating a unified system for international flight tracking.

Now, I always called it ICAO, which is how we pronounce it in the Army. Is it ICAO or is it ICAO?

Ambassador LAWSON. ICAO.

Ms. DUCKWORTH. ICAO. OK. See, we were saying it wrong in the Army the whole time. Well, we were just a bunch of helicopter pilots. What did we know?

So ICAO, the International Air Transport Association, the NTSB have all been active participants in trying to find a solution to this problem, and I really want to thank you for the work you are doing. I look forward to fully examining this issue at great lengths today.

I thank the chairman for his very kind and generous remarks, and I continue to look forward to working with him to monitor these issues in the future.

I yield back, Mr. Chairman.

Mr. MICA. Thank you.

Now, again, I refer to his proposed legislation and one of the experts in Congress on aviation, former chair of the Aviation Subcommittee in the House, Mr. Duncan, the gentleman from Tennessee. You are welcome.

Mr. DUNCAN. Thank you very much, Mr. Chairman, for calling this hearing, and thank you for your very supportive comments about my legislation. As you mentioned, I did chair the Aviation Subcommittee for 6 years, from 1995 to 2001, and then you followed me in that position and, of course, later chaired the full committee, and you always have had a great interest in and concern about aviation issues, and certainly that is evident here in your calling this early hearing in your chairmanship of this subcommittee.

This is an issue that I have been interested in for a long time. In 1999, under the chairmanship of Jim Hall, the NTSB issued a safety recommendation calling for two sets of black boxes on commercial aircraft, and I am pleased that former Chairman Hall is here today. As late as the week before last, a working group of the ICAO organization issued a recommendation that deployable recording boxes be put on commercial aircraft in the very near future, and that is exactly what my bill, H.R. 772, calls for as well, and certainly one of the lead witnesses here today is our Ambassador to ICAO, Ambassador Lawson; and we are pleased to have all the witnesses here.

My bill is entitled The SAFE Act, and it requires that manufacturers install deployable recorders on all aircraft ordered after January 2017, and these deployable recorders would contain both voice and data information. They would automatically eject from an airplane upon a crash and thus could save untold millions of dollars in searching costs and would certainly be a great step forward in trying to solve the problems related to various aircraft crashes and so forth.

We are really way behind the times on this. I have a report here that says deployable recorders have been used in military and over water helicopter applications since the 1960's and are currently available from several manufacturers. They combine traditional FDR and CDR functions into one unit and are capable of providing a comparable amount of flight data. So I think that we are well past the time that this should have been done and I am encouraged by all the support that is coming both here nationally and internationally for my legislation.

Congressman Price, one of our most respected members, has introduced companion legislation, H.R. 753, which goes right along with the bill that I have introduced, and hopefully we can get some progress in this Congress in that regard.

Thank you, Mr. Chairman, for calling this hearing and for allowing me to make these brief comments. Thank you.

Mr. MICA. Thank you.

Mr. Amash, did you have an opening Statement?

Mr. AMASH. I do not.

Mr. MICA. OK. Any other members?

Recognize Ms. Duckworth.

Ms. DUCKWORTH. Thank you, Mr. Chairman. I have a Statement from Congressman Price for the record and I would like to submit it.

Mr. MICA. Without objection, it will be made part of the record.

Ms. DUCKWORTH. Thank you.

Mr. MICA. We will leave the record open for a period of 10 legislative days for additional comments or questions to the witnesses. Without objection, so ordered.

All right, if there are no further opening Statements at this point, I would like to introduce our panel of witnesses. We are very fortunate today to have with us the United States Ambassador to the United States Mission of ICAO, Ambassador Michael A. Lawson. We have the Honorable Christopher Hart. He is the Acting Chair of the National Transportation Safety Board. And we have Mr. Kevin Hiatt, and he is the Senior Vice President for Safe-

ty and Flight Operations for the International Air Transport Association.

Some of you have been before us before. If you haven't, this is an oversight and investigative panel. We do swear in our witnesses, so if you would stand, raise your right hand. Do you solemnly swear or affirm that your testimony before this subcommittee of Congress is the whole truth and nothing but the truth?

[Witnesses respond in the affirmative.]

Mr. MICA. Let the record reflect that the witnesses answered in the affirmative.

Again, welcome to each of you. Be seated.

What we do, we don't have multiple panels and we don't have a huge number of witnesses, so we can be flexible on the 5-minute rule. We do want to hear your Statement. If you have lengthy information or background that you want to submit to the record, just a simple request to the chair and we will make certain it is inserted in the record appropriately.

With that, let me welcome and again thank our Ambassador, Ambassador Lawson, who has been great to work with on this issue. We will hear his testimony today. Welcome, sir, and you are recognized.

WITNESS STATEMENTS

STATEMENT OF THE HONORABLE MICHAEL A. LAWSON

Ambassador LAWSON. Thank you very much, Mr. Chairman. Chairman Mica, Ranking Member Duckworth, and other distinguished members of this subcommittee, I appreciate the opportunity to testify in front of this committee regarding efforts to accelerate the establishment of international standards relating to the tracking of commercial airliners over oceanic areas in response to the recent loss of Malaysia Flight 370.

As U.S. Ambassador to the International Civil Aviation Organization, this issue is one of my highest priorities. International responses to complex challenges have historically been frustratingly slow. However, in the aftermath of the MH370 tragedy, the international aviation community has responded with an appropriate sense of urgency.

Weeks after the MH370 disappearance, ICAO convened a special multi-disciplinary meeting to study issues related to global airline flight tracking. The meeting concluded that there was a need to accelerating the existing time table to track aircraft effectively and globally, and that the solution would have to involve more than the introduction of technology. A comprehensive approach that involves the coordination of airline industry practices, air traffic control procedures, search and rescue capabilities, and accident investigation processes would be required.

In our following months, an industry-led task force was formed to focus on what airlines could do to support flight tracking in the near-term while the ICAO working group developed an overarching concept of operations.

The ICAO concept broke the tracking problem down into four items: normal tracking, abnormal tracking, distress tracking, and

retrieval of accident data. These two groups, industry and ICAO, worked to harmonize their proposals and, on February 3d, presented their recommendations to a high level safety conference attended by more than 850 delegates from over 120 States. The ICAO conference endorsed the operational concept.

I would like to call your attention to the progress made in two key areas, normal aircraft tracking and retrieval of accident data.

Normal aircraft tracking. An international standard for normal aircraft tracking has progressed rapidly. The normal tracking standard seems basic, but it will create the foundation upon which additional requirements will be built. ICAO's proposed normal tracking standard clearly assigns responsibility for tracking to the airline. It requires that every operator track the location of the aircraft every 15 minutes when the aircraft are flying over oceanic airspace unless air traffic control is providing surveillance, but also requires that airlines develop procedures to coordinate with air traffic control facilities in the event a position report is missed.

We believe that these basic procedures would significantly improve search and rescue responses in the event another tragedy were to occur.

The standards proposed by ICAO did not contain specific tracking technologies. Through collaboration with industry, an array of current and emerging technologies capable of meeting the proposed normal tracking standard have been identified. ICAO will be distributing their proposal to member States for review this week. ICAO will incorporate comments received from the States and offer the standard for adoption by the ICAO Council during November of this year. The planned global applicability date is November 2016. A copy of ICAO's letter has been provided for the record.

For the United States, FAA regulations already require some level of centralized tracking, and U.S. airlines have fairly sophisticated operational control centers capable of meeting this challenge. However, other regions of the world may find this standard more challenging. For this reason, ICAO will conduct a normal aircraft tracking initiative in Asia later this year. The initiative is designed to assist in identifying challenges with technology and procedures, and help the industry gain operational experience. The FAA will be providing assistance and guidance and advice, and we expect U.S. airlines will participate.

With respect to the retrieval of accident data, the proposed standards to address the recovery of cockpit voice and flight data recorders are also progressing rapidly. The standards will target the recovery of data following an accident. One possible method to facilitate recovery of post-accident data would be to mandate deployable flight recorders. However, during the recent high-level safety conference, industry and regulators from around the world urged ICAO to draft performance-based standards that would leave the door open to other emerging technologies such as streaming data, which may be easier and possibly quicker to implement.

ICAO has drafted the initial performance-based standards for accident data recovery. The standards will likely require changes or additions to aircraft equipment, and for this reason it may take several years to implement them. The standards will also require the development of extensive guidance materials. Depending on the

technological solutions, the changes to aircraft equipment would be phased in beginning in 2019 or 2021. The proposal is not scheduled for adoption by the ICAO Council until March 2016.

Mr. Chairman, ICAO, with the support of the United States and the international community, has responded quickly to the challenge of global flight tracking. Standards that would normally take years of deliberation have been developed in months. The FAA and U.S. airlines are recognized leaders when it comes to the issue of aircraft tracking and, as you know, the FAA has, for years, provided assistance to other regions of the world in their efforts to adapt their operations to accommodate air traffic management, and now they are being asked to assist with aircraft tracking. This is a great example of America's global leadership that should be encouraged and continued.

It is my hope that the United States will continue to apply its substantial expertise toward the development and maturation of global aircraft tracking standards, and that any new U.S. regulations will be harmonized with the international standards that emerge as a result of our collective efforts.

Thank you, and I look forward to hearing your concerns and answering any questions you may have.

[Prepared Statement of Ambassador Lawson follows:]

Department of State
U.S. Representative to the International Civil Aviation Organization
(ICAO), Michael Lawson
Opening Statement
House Committee on Oversight and Government Reform
Subcommittee on Transportation and Public Assets
Hearing on Preventing Another MH370: Setting International
Standards for Airline Flight Tracking
February 25, 2015

Chairman Mica, Ranking Member Duckworth, and distinguished members of the Subcommittee: I appreciate the opportunity to testify in front of this committee regarding efforts to accelerate the establishment of international standards related to the tracking of commercial airliners over oceanic areas, in response to the recent loss of Malaysia Airlines 370. As the U.S. Ambassador to the International Civil Aviation Organization, this issue is one of my highest priorities.

International responses to complex challenges have historically been frustratingly slow. However, in the aftermath of the MH370 tragedy, the international aviation community has responded with an appropriate sense of urgency. Weeks after the MH370 disappearance, ICAO convened a Special Multi-Disciplinary Meeting to study issues related to Global Airline Flight Tracking. The meeting concluded that there is a need to accelerate the existing timetable to track aircraft effectively and globally, and that the solution would have to involve more than the introduction of technology. A comprehensive approach that involves the coordination of airline industry practices, air traffic control procedures, search-and-rescue capabilities, and accident investigation processes would be required.

In the following months, an industry-led task force was formed to focus on what airlines could do to support flight tracking in the near-term, while the ICAO working group developed an over-arching concept of operations (CONOPS). The ICAO concept broke the tracking problem down into four items; Normal Tracking, Abnormal Tracking, Distress Tracking, and Retrieval of Accident Data. These two groups, industry and ICAO, worked to harmonize their proposals, and on February 3 presented their recommendations to a High-Level Safety Conference attended by more than 850 delegates from over 120 States. The ICAO conference endorsed the operational concept.

I would like to call your attention to the progress made in two key areas; normal aircraft tracking, and retrieval of accident data.

Normal Aircraft Tracking:

An international standard for normal aircraft tracking has progressed rapidly. A normal tracking standard seems basic, but it will create the foundation upon which additional requirements will be built. ICAO's proposed "normal tracking" standard clearly assigns the responsibility for tracking to the airline. It requires that every operator track the location of their aircraft every 15 minutes when their aircraft are flying over oceanic airspace, unless air traffic control is providing surveillance. It also requires that airlines develop procedures to coordinate with air traffic control facilities in the event a position report is missed. We believe these basic procedures would significantly improve search and rescue responses in the event another tragedy occurs.

The standards proposed by ICAO do not contain specific tracking technologies. Through collaboration with industry, an array of current and emerging technologies capable of meeting the proposed normal tracking standard have been identified.

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Regarding the retrieval of Accident Data:

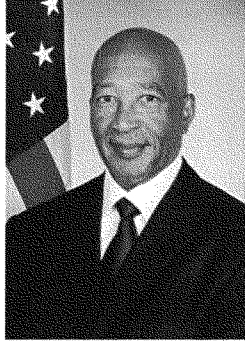
The proposed standards to address the recovery of Cockpit Voice and Flight Data Recorders are also progressing quickly. The standards will target the recovery of data following an accident. One possible method to facilitate the recovery of post-accident data would be to mandate deployable flight recorders. However during the recent High-Level Safety Conference, industry and regulators from around the world urged ICAO to draft performance-based standards that would leave the door open to other emerging technologies such as streaming data, which may be easier and possibly quicker to implement.

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Mr. Chairman, ICAO, with the support of the United States and the international community, has responded quickly to the challenge of global flight tracking. Standards that would normally take years of deliberation have instead been developed in months.

The FAA and U.S. airlines are recognized leaders when it comes to the issue of aircraft tracking, and as you know the FAA has for years provided assistance to other regions of the world in their efforts to adapt their operations to accommodate air traffic management, and now they are being asked to assist with aircraft tracking. This is a great example of America's global leadership that should be encouraged and continued.

It is my hope that the United States will continue to apply its substantial expertise towards the development and maturation of global aircraft tracking standards, and that any new U.S. regulations will be harmonized with the international standards that emerge as the result of our collective efforts.



U.S. Ambassador Michael A. Lawson

President Obama nominated Michael A. Lawson to be the U.S. Representative to the International Civil Aviation Organization (ICAO) on September 11, 2013. The U.S. Senate approved the nomination on July 21, 2014. Ambassador Lawson was sworn in by Federal District Court Judge Terry J. Hatter, Jr., on July 22, 2014, in Los Angeles. Ambassador Lawson presented his credentials to ICAO Council President Benard Aliu and Secretary General Raymond Benjamin on July 25, 2014.

Michael A. Lawson is the immediate past President of the Board of Airport Commissioners (BOAC) for Los Angeles World Airports, which oversees Los Angeles International Airport, Los Angeles/Ontario International Airport and Van Nuys Airport. Mr. Lawson served as a member of the BOAC from 2005 – 2013 and as President of the BOAC from December 2010 – August 2013.

While serving as a member of the Board of Airport Commissioners, Mr. Lawson was also a Partner with the law firm of Skadden, Arps, Slate, Meagher & Flom LLP, where he led the Executive Compensation and Employee Benefits Group for the Los Angeles office and the west coast. Mr. Lawson served as an attorney with Skadden for more than 31 years until his retirement in December of 2011. In his role at Skadden, he regularly advised trustees of pension and other employee benefits funds as well as board directors of companies that sponsor pension plans and financial institutions that manage pension plan assets regarding issues involving fiduciary responsibility and other matters. He also provided advice in the context of merger and acquisition transactions, bankruptcy, litigation and other matters. He has consistently been recognized as one of "America's Leading Lawyers for Business" by Chambers USA as well as a "Southern California Super Lawyer."

Mr. Lawson also served as a member of the Board of Trustees of the California State Teachers Retirement System (CALSTRS), which is the second largest retirement system in the United States (appointed by the Governor of California for a term ending December 31, 2013) as well as the Oversight Board for the Community Redevelopment Successor Agency/Los Angeles (appointed by the Mayor of Los Angeles). In addition, he has served as a Trustee of Morehouse College in Atlanta, GA and Loyola Marymount University of Los Angeles. He was also a board director and former chairman of the Constitutional Rights Foundation, and a board director for the Advancement Project, the Music Center / Performing Arts Center of Los Angeles County, and the Music Center Foundation.

Mr. Lawson holds a BA in Political Science and Economics from LMU, Class of 1975 and a JD from Harvard Law School, Class of 1978. In 2010, he was the recipient of the Strickland Excellence Award from the African American Alumni Association (AAAA). Mr. Lawson and his spouse, Mattie McFadden-Lawson, reside in Los Angeles and have two adult sons: Jonathan and Michael, Jr.

Mr. MICA. Well, thank you.

We will go to our next witness.

Before we do that, I see Mr. Price, the gentleman from North Carolina, joining us, and I would ask unanimous consent that he be permitted to participate in the panel, and he would be recognized after other members.

Welcome, sir. Please take a seat, and you will be recognized. Without objection, so ordered.

Now let me introduce and again thank also for his hospitality Mr. Christopher Hart, the Acting NTSB Safety Board Chair.

And if members and staff have not gone down to their operations, I went down actually to look at some of the retrieved equipment from the site of the Metro arcing incident where one person was killed and they bring some of the parts and debris to their lab downtown here. But I also got a chance to visit upstairs several of the labs where they have airline crash black boxes, the remains from different crashes, even a bus tire in another lab, and the sophisticated equipment and work that NTSB does in investigating a whole host of accidents. If staff or members have not gone, please go down and see the incredible job that they do.

But thank you for your hospitality. I know I was there and some of our staff, but, again, on the work you do. So welcome, Mr. Hart, and you are recognized.

STATEMENT OF THE HONORABLE CHRISTOPHER A. HART

Mr. HART. Thank you, Chairman Mica. The pleasure was ours to have you come and see what we do because we are proud of it and we love to show it off.

Good morning, Chairman Mica, Ranking Member Duckworth, and members of the subcommittee. Thank you for inviting me to testify today on behalf of the NTSB.

From the start of the Air Safety Board and the Civil Aeronautics Act of 1938, Congress directed that the Board "reduce accidents by conducting studies and investigations on matters pertaining to safety and air navigation and the prevention of accidents."

In the history of aviation, recorders and the wealth of data they provide are the technology that has most helped the NTSB and our international counterparts achieve this objective of preventing accidents and improving safety. Without them, we are unable to determine what really happened, as was the case during the 2-years that the flight data recorder and the cockpit voice recorder remained under water after the crash of Air France Flight 447. Recorders significantly enhance our ability to determine what happened, and from that to make recommendations to prevent recurrences.

From the early days of the NTSB, we have recommended that recorders be more robust because of the lessons learned in our safety investigations, and today, more than 40 years later, we are again asking for more improvements to recorder technology. Last month we asked the FAA to require that commercial aircraft operating more than 50 nautical miles from shore be equipped to transmit their location within 6 nautical miles in the event of a crash and to require that these aircraft be equipped with a low-frequency location device that will transmit their underwater location for 90

days. We also recommended a way to recover data without requiring underwater retrieval and that all of these requirements be harmonized internationally.

Also, accidents such as SilkAir and EgyptAir remind us that seeing what is happening in the cockpit would help us know much better the totality of what happened, so the NTSB also recommended that cockpits have image recorders to capture that information for 2 hours. These recommendations are not about gotcha moments, they are about learning and improving safety.

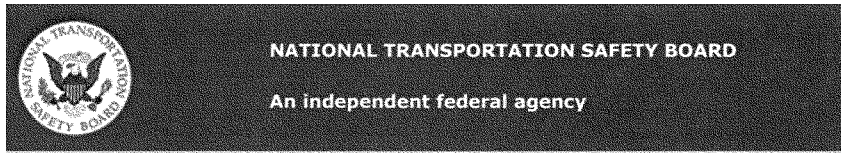
Earlier this month I participated in the high-level safety conference at ICAO that has been referred to previously with my colleagues who are here today. At this meeting, the ICAO member States considered a way forward to dealing with the issue of tracking aircraft in real time. The tragic events over the last year have focused the entire international aviation community in developing new standards.

The conference proposed the development of performance-based standards to improve tracking, locating, and data recovery, as you have already heard, and similar to what the NTSB proposed in our recent recommendations. The ICAO proposals are a critical step toward the option of a performance-based standard. More work needs to be done and the NTSB will continue to provide its guidance and counsel as informed by our investigation experience to our ICAO Ambassador as that process moves forward.

The NTSB and its international counterparts have concluded that in this day and age lost aircraft and lost data from those aircraft should be a thing of the past.

Thank you for holding this hearing on this important topic to advance aviation safety worldwide. I would be happy to answer any questions that you may have.

[Prepared Statement of Mr. Hart follows:]



**The Honorable Christopher A. Hart
Acting Chairman
On Behalf of the
National Transportation Safety Board**

Before the

**Subcommittee on Transportation and Public Assets
Committee on Oversight and Government Reform
United States House of Representatives**

Hearing on

**Preventing Another MH370:
Setting International Standards for Airline Flight Tracking
Washington, DC
February 25, 2015**

Chairman Mica, Ranking Member Duckworth, and Members of the Subcommittee, thank you for inviting the National Transportation Safety Board (NTSB) to testify before you today.

The NTSB is an independent Federal agency charged by Congress with investigating every civil aviation accident and significant incidents in the United States and significant accidents and incidents in other modes of transportation – railroad, highway, marine and pipeline. The NTSB determines the probable cause of accidents and other transportation events and issues safety recommendations aimed at preventing future accidents. In addition, the NTSB carries out special studies concerning transportation safety and coordinates the resources of the Federal Government and other organizations to provide assistance to victims and their family members impacted by major transportation disasters.

Today, I would like to summarize for the Subcommittee the paramount role played by recorders in determining the cause of an aviation accident or incident; information the NTSB obtained in a forum we hosted in October 2014 on Emerging Flight Data and Locator Technology; and the series of recommendations we issued last month to the Federal Aviation Administration (FAA) calling for improvements in locating downed aircraft and ways to obtain critical flight data faster and without the need for immediate underwater retrieval.

The Role of Flight Data Recorders and Cockpit Voice Recorders in Aviation Safety

The NTSB depends on flight data recorders (FDRs) and cockpit voice recorders (CVRs) to help determine the causes of accidents and incidents in aviation. Because of their value in investigations, rapid location and recovery of these recorders, and access to the vital information they contain, are among our highest priorities. Flight recorders were first created specifically to capture information about a flight that would assist after a crash and were designed to survive the catastrophic conditions that a crash can entail. Their introduction has been a boon to aviation safety. In many cases recorders are the most significant source of useful information about an accident, and in some cases, they are the only source of information. In addition, the required underwater locator beacons have guided searchers to submerged recorders by their signal, or “ping,” when submerged in water. Once activated by submersion in water, the device’s batteries can power this signal continuously for at least 30 days. In some newer models, the batteries can power the signal for at least 90 days.

Recorders have ensured the survival of accident data under the harshest conditions. In many cases, they have yielded useful data despite the traumatic forces of accident sequences and despite subsequent immersion in water or being engulfed in fire. The data that recorders preserve have shed light on accident circumstances, helping to guide safety improvements.

Increased engine and system reliability allow today’s aircraft to fly farther from a suitable landing point than ever before. Satellite tracking makes it possible to monitor aircraft even in the most remote parts of the globe, and these advances have changed the way we fly. When an accident does happen, it may be in one of these remote locations. It takes longer to respond, and it is more difficult to get the appropriate resources to the search area. Having a starting point to define the search area is critical to success in locating the aircraft.

As we are well aware, in recent years, there have been a few exhaustive, expensive, and well publicized searches for missing aircraft and their recorders. The events involving Air France Flight 447 in 2009 and Malaysia Airlines Flight 370 have raised serious concerns within the NTSB and in other safety organizations here and abroad. After the crash of Air France Flight 447, it took almost two years and \$40 million to find the recorders. Investigators are still searching for Malaysia Airlines Flight 370. So far the search has involved 26 countries using 84 vessels and numerous aircraft. As stated in the Australian Transport Safety Bureau's most recent Operational Update Report (February 18, 2015), more than 24,000 square kilometers of ocean floor have been searched without locating the aircraft's CVR, FDR, or any wreckage.

The NTSB's Longstanding Role in Advocating for Improvements in Recorder Technology, Recorder Recovery, and Locating Aircraft After an Accident

From the agency's earliest days, the NTSB has been vitally interested in the effectiveness of recorders. For example, shortly after an accident involving a National Airlines aircraft in New Orleans, Louisiana, on September 3, 1967, the NTSB issued a recommendation¹ to the Federal Aviation Administration (FAA) pointing to CVR inadequacies and called for the FAA to review its installation approvals granted to aircraft operators.

After an engine fan assembly disintegrated during the flight of another National Airlines passenger aircraft near Albuquerque, New Mexico, on November 3, 1973, resulting in 1 fatality and 24 injuries, the NTSB's investigation disclosed a malfunction in the FDR. Testimony during the NTSB's public investigative hearing and subsequent data recovery efforts by NTSB staff disclosed that of the 13 aircraft in the carrier's fleet, 7 had been operating with undetected malfunctions which would have precluded recovery of acceptable data. As a result of its investigation, the NTSB issued 3 recommendations² to the FAA to take appropriate corrective actions to ensure the proper operation and reliability of these recorder systems.

In 1975, the NTSB issued a special study entitled "Flight Data Recorder Readout Experience in Aircraft Accident Investigations 1960-1973"³. The report was based on a review of 509 accident and incident flight recorder readouts over a 14-year period. The report mentions 4 cases where the FDR was not recovered because the wreckage was in deep water and could not be located. It also describes an earlier NTSB safety recommendation⁴ that led to the FAA amending Part 121 of the Federal Aviation Regulations (FAR) to require each recorder to be equipped with an approved underwater locator beacon to assist in locating the recorder under water.

The special study also describes the crash of Trans World Airlines Flight 841 in the Ionian Sea on September 8, 1974. The NTSB's Aircraft Accident Report⁵ for this accident recounts the following efforts to recover the flight recorder:

¹ A-67-030

² A-73-116, A-73-117, and A-73-118

³ Report No. NTSB-AAS-75-1

⁴ A-72-56

⁵ Report No. NTSB-AAR-75-7, March 26, 1975

In accordance with 14 CFR 121.343, an underwater locator beacon (Dukane Model N15F210B) was mounted on the recorder. According to its manufacturer, this locator (Pinger) had an operating depth of 20,000 feet, a detection range of 2,000 to 4,000 yards, and was capable of transmitting acoustic signals for 30 days after activation by water.

From September 8, 1974, to September 20, 1974, air, surface, and subsurface units from the U.S. Sixth Fleet attempted to locate the recorder by conducting visual, radar, and acoustic searches; however, their efforts were unsuccessful. The Safety Board then contracted the Supervisor of Salvage, Department of the Navy, to search the area in which the Sixth Fleet believed the wreckage to be located. On October 4, 1974, salvage experts using a dipping hydrophone system, detected the pinger signal in an area with a depth of 10,380 feet.

Neither the FDR nor the CVR was recovered.

Faced with the likely high costs of recovering the aircraft wreckage and the recorders, the possibility that the pinger separated from the flight recorder at impact or that the recorder with the attached pinger were separated from the main wreckage, there were no further recovery efforts.

The NTSB is also interested in ways to recover critical flight data in a more timely manner without immediate underwater retrieval of flight recorders. Locating and recovering flight recorders in over-water accidents has been more problematic than those occurring on land. Once recovered, flight recorders have been highly reliable, and data have been successfully downloaded. However, there have been rare instances in which recorders have not been recovered or data were lost due to damage from exposure to severe fire or underwater conditions. Because of this, in March 1999, the NTSB issued a recommendation⁶ asking the FAA to require the installation of dual combination flight recorders that include both CVR and FDR functionalities on board newly built aircraft. In issuing the recommendation the NTSB pointed out that since 1983, there had been 52 accidents and incidents in which information from either a CVR or FDR or both were lost due to interruption of electrical power following an engine or generator failure or crew action.

In addition to recommending improvements in recorders required to be installed in aircraft subject to Part 119, 121, 125, or 135 of the FAR, the NTSB has also issued recommendations calling for replacement of the emergency locator transmissions (ELTs) in most general aviation airplanes subject to Part 91 of the FAR. Although Congress, in 1970, enacted a statutory requirement mandating the installation of ELTs in most of these aircraft, the NTSB has repeatedly called for improvements and replacement of older model beacons. As a result of the NTSB's investigation of a 9-fatality accident involving a Department of Interior operated Cessna 208B in Montrose, CO on October 8, 1997, the agency recommended that the FAA require the installation of newer, digital 406 megahertz ELTs. A subsequent recommendation in 2007 recommended that the FAA seek authority from Congress to require upgrades of Technical

⁶ A-99-17

Standard Order (TSO) C 126 [406 megahertz] ELTs prior to the discontinuance of satellite processing of 121.5 megahertz ELT signals.⁷ To date, however, the FAA has responded that it cannot require the installation of 406 megahertz ELTs and will not seek statutory authority to do so. Without satellite detection capabilities, aircraft broadcasting at 121.5 MHz can only be discovered if overflying aircraft monitor 121.5 MHz and report audible signals to air traffic control and, even then, no exact accident location can be discerned.

The limitations of this archaic method of detection played a role in an October 26, 2011 accident in Lexington, Oregon involving a Cessna 182R. The NTSB's investigation found that both occupants initially survived the crash. While one injured occupant was able to exit the airplane, it took him 4 hours to find a location where he could call for help. When first responders arrived the pilot had died, even though the airplane's 121.5 MHz ELT was still operating. The NTSB concluded that a notification from a functional 406 MHz ELT would have been received within minutes of the crash, significantly reducing the emergency response time and greatly increasing the chances of the pilot's survival.

The NTSB has also issued safety recommendations on cockpit image recording systems and protection against deactivation of recording systems. In April 2000, in response to investigations of several accidents involving a lack of information regarding crewmember actions and the flight deck environment, including ValuJet Flight 592, SilkAir Flight 185, Swissair Flight 111, and EgyptAir Flight 990, the NTSB issued two recommendations to the FAA. One recommendation⁸ asked the FAA to require that that in-service aircraft operated under 14 CFR Part 121, 125, or 135 be equipped with a crash-protected cockpit image recording system. The second recommendation⁹ asked for similar action for newly manufactured aircraft that would be operated under 14 CFR Part 121, 125, or 135. Both recommendations also asked that the FAA require placing recorder system circuit breakers in locations the flight crew could not access.

The NTSB now believes it is appropriate to clarify these recommendations by separating the issue of recorder system circuit breaker accessibility from the issue of cockpit image recording systems and to update the recommendations by incorporating government and industry developments in cockpit image technology.

In the SilkAir and EgyptAir crashes, the CVR and FDR recordings provided limited information about crew actions and the status of the cockpit environment. Further, in the Air France Flight 447 crash and the September 3, 2010, crash of a Boeing 747-44AF, operated by United Parcel Service while attempting to return to Dubai International Airport following an in-flight cargo fire, the accident aircraft were equipped with FDRs that greatly exceeded the minimum parameter requirements. However, in these accidents, critical information related to the cockpit environment conditions (for example, crew actions and visibility), instrument indications available to crewmembers, and the degradation of aircraft systems was not available

⁷ A-07-51

⁸ A-00-30. In 2006, the NTSB reiterated SR A-00-30 as a result of its investigation of a 2004 accident involving Corporate Airlines Flight 5966, a BAE-J3201 aircraft, in Kirksville, Missouri.

⁹ A-00-31

to investigators. Modern cockpit imaging systems can provide the information needed to help determine the cause of these types of accidents.

Recent NTSB Activities and Actions

Notwithstanding the NTSB's nearly 50 years of aviation accident investigations and role in securing improvements in recorder capabilities and locator technologies, the agency clearly recognizes that sophisticated aircraft accident investigation and analysis cannot be accomplished without recorded flight data. In order for our important work to continue and make a difference in saving lives, we must ensure that the technologies are available to locate aircraft wreckage and recorders after an accident and that critical flight data can be recovered.

NTSB Public Forum on Emerging Flight Data and Locator Technology

The NTSB has long been concerned about rapid recovery of recorded information to guide investigations, help determine accident causes, and develop recommendations to prevent recurrences. To focus attention on this issue, the NTSB convened its *Emerging Flight Data and Locator Technology Forum* on October 7, 2014, in Washington, D.C. Forum discussions among government, industry, and investigative experts helped identify the following safety issues:

- The need for improved technologies to locate aircraft wreckage and flight recorders following an accident in a remote location or over water.
- The need for timely recovery of critical flight data following an accident in a remote location or over water

The Forum included 4 panels:

Panel 1, consisting of officials from the FAA, the European Aviation Safety Agency, and the International Civil Aviation Organization (ICAO), discussed the organizational framework and structure of the US and international regulatory and standards bodies

Panel 2, consisting of representatives from Boeing Commercial Airplane Company, Airbus, Honeywell, and Inmarsat, addressed the airframe manufacturer, supplier, and infrastructure provider's perspectives on technology solutions to provide more timely location and recovery of flight data following an accident

Panel 3, consisting of representatives from France's Bureau d'Enquêtes et d'Analyses, the Naval Sea Systems Command, L3 Communications Company, DRS Technologies Canada Ltd., and FLYHT Aerospace Solutions Ltd., summarized possible technical solutions that can assist in wreckage location, recorder retrieval, and flight data recovery. The panel also addressed the technical details of two specific technologies -- a deployable flight recorder system and a method for wireless transmission of flight data.

Panel 4, consisting of representatives from the Air Line Pilots Association, American Airlines, and the FAA, addressed obstacles that need to be overcome to implement new and emerging technologies that would allow for a more efficient recovery of flight data.

Other noteworthy information provided at the forum includes the following:

Deployable recorder technologies: These technologies can be used to recover flight data without the delay of a long and expensive underwater recovery. Deployable recorders have been used in military and over water helicopter applications since the 1960s and are currently available from several manufacturers. They combine traditional FDR and CVR functions into one unit and are capable of providing a comparable amount of flight data. They are designed to separate from the aircraft upon fuselage structural deformation or when submersed in water. If in water, they float indefinitely on the surface. These units are also equipped with ELTs that operate on the 121.5 megahertz and 406 megahertz frequencies for location and recovery. Standards already exist for automatically deploying flight recorders.

Triggered flight data transmission: A manufacturer of flight data transmission technology testified that triggered flight data transmission was not only feasible, but also already in service on some aircraft. Additionally, at this time, manufacturers and operators are equipping their aircraft with commercial satellite communications systems that can support broadband video, voice, and data transmissions. Commercial satellite systems on the market today are primarily used for passenger and crew connectivity and can support speeds of 200-400 kilobits per second. Higher speed capability is forthcoming. Such bandwidth would enable real-time parametric flight data transmission to begin after a triggering event as well as transmission of a limited amount of stored flight data recorded before the triggering event.

NTSB Recommendations Addressing Better Ways to Find Aircraft Accident Sites and Retrieve Critical Flight Data

On January 22, 2015, the NTSB issued a series of safety recommendations to the FAA¹⁰ calling for improvements in locating downed aircraft and ways to obtain critical flight data faster and without the need for immediate underwater retrieval. The NTSB also re-emphasized the need for cockpit image recorders on commercial airplanes.

In issuing its recommendations, the NTSB recognized there are significant ongoing international industry and regulatory efforts to develop and adopt standards for enhanced aircraft position reporting and supplemental methods for recovering flight data. Achieving these goals on a global basis will demand a harmonized approach that addresses the needs of many stakeholders and ensures that domestic and foreign parties operate under equivalent standards. We also strongly support the need for performance-based standards for emerging technologies and data recovery. We applaud Ambassador Lawson and ICAO for their continued important work in addressing these issues.

¹⁰ A-15-1 to -15-6.

The NTSB recommendations urge the FAA to:

- Require that all aircraft used in extended overwater operations (*i.e.*, operations that occur over water at a horizontal distance of more than 50 nm from the nearest shoreline) and operating under Part 121 or Part 135 of the FAR that are required to have a CVR and an FDR, be equipped with
 - a tamper-resistant method to broadcast to a ground station sufficient information to establish the location where an aircraft terminates flight as the result of an accident within 6 nautical miles of the point of impact, and
 - an airframe low frequency underwater locating device that will function for at least 90 days and that can be detected by equipment available on military, search and rescue, and salvage assets commonly used to search for and recover wreckage.
- Require that all newly manufactured aircraft used in extended overwater operations and operating under Part 121 or Part 135 of the FAR that are required to have a CVR and an FDR, be equipped with a means to recover, at a minimum, mandatory flight data parameters; the means of recovery should not require underwater retrieval. Data should be captured from a triggering event until the end of the flight and for as long a time period before the triggering event as possible.
- Coordinate with other international regulatory authorities and ICAO to harmonize the implementation of the above-identified requirements recommended by the NTSB for locating where an aircraft terminates flight as the result of an accident and recovery of mandatory flight data parameters.
- Identify ways to incorporate adequate protections against disabling flight recorder systems on all existing transport category aircraft.
- Require that all newly manufactured transport category aircraft incorporate adequate protections against disabling flight recorder systems.

Closing

I commend the Subcommittee for holding this hearing on these critical aviation safety issues—issues that are receiving the highest level of attention internationally and within the United States. With the hard work underway by international organizations, foreign governments, the U.S. Government, and the aviation community, clear, steady progress is occurring to implement improvements to our already remarkably safe aviation system.

Thank you for inviting me to testify today. I am happy to answer your questions.

Mr. MICA. Thank you for your testimony.

We will hear next from Kevin Hiatt. He is the Senior Vice President for Safety and Flight Operations of IATA. Welcome, sir. Thank you also for your past cooperation, and you are recognized.

STATEMENT OF KEVIN HIATT

Mr. HIATT. Thank you, Chairman Mica. Chairman Mica, Ranking Member Duckworth, and distinguished members of the subcommittee, thank you for the opportunity to testify on behalf of the 250-plus members of the International Air Transport Association, IATA, on this very important issue of aircraft tracking.

IATA's mission in the 70 years of its existence has been to represent, lead, and serve the global air transport industry. Our members account for 84 percent of global air traffic. IATA and its member airlines are committed to maintaining a safe and efficient international air transportation system. IATA member airlines have an exemplary safety record, with 0.3 accidents per one million flights in 2013. Aviation is safe and remains safe because its culture is one of seeking continuous improvement.

In 2003, IATA advanced global aviation safety with its introduction of the IATA Operational Safety Audit, known as IOSA, which is an internationally recognized and acceptable evaluation system designed to assess the operational members and management and control of systems and airlines. All IATA members are IOSA registered and must remain registered to maintain IATA membership.

From 2009 through 2013, the accident rate for airlines on the IOSA registry was 2.5 times better than that for a non-IOSA registered airline. As such, IOSA has become the global standard, recognized well beyond IATA membership. As of October 2014, 154, or 38 percent, of the 402 airlines that are IOSA registered were non-IATA members.

In 2014, commercial aviation experienced tragedies that remind us that we cannot rest on our safety record and that we must do all our best to anticipate the unanticipated, even if the possibilities are deemed extremely remote. We are nearing an infamous first anniversary of the unexplained loss of Malaysia Airlines Flight 370, a State-of-the-art commercial aircraft operating in radar-controlled airspace.

Soon after the disappearance of Flight 370, IATA brought together partners from across the aviation industry, including airlines, air navigation service providers, pilots, manufacturers, the civil aviation organization, and many other key stakeholders to undertake a critical review of current and future aircraft tracking capabilities, and identify near-term options to improve these capabilities.

Throughout the summer and fall of 2014, this task force reviewed today's technologies, procedures, and best practices in terms of aircraft tracking. The task force found that most airlines track their fleets through a variety of means, including the vast majority who track through air traffic surveillance services, where they exist. We also verified that there are existing technologies, services, and procedures that can enhance aircraft tracking in the near-term

and that a performance-based approach must be employed. There is no one-size-fits-all solution. Established procedures must be followed and, where needed, improved to ensure clear, consistent, and timely communications between air navigation service providers and the airlines.

While the focus of the industry group was on the near-term, it was recognized that emerging technologies will create new capabilities in the global air navigation infrastructure, including an improved ability to track aircraft.

The task force report was provided to ICAO in early December. ICAO incorporated its findings into their Global Aeronautical Distress Safety System document, known as GADSS. GADSS is a consent of operation for routine, non-routine, emergency, and search and rescue situations. While these various stages are well defined in the GADSS document, IATA is concerned with suggestions that our industry should implement unnecessary solutions in the near-term that would be more effectively addressed as more effective technology solutions are implemented over the next years. For example, any deployment of automatic deployable flight recorders would be redundant for some airlines that implement real-time data streaming.

On February 2d through the 5th, 2015, ICAO held a high-level safety conference. The agenda from that conference addressed several key areas, including aircraft tracking, risks to commercial aviation in conflict zones, and sharing and protection of safety information. ICAO member States concluded that, one, international standards for aircraft tracking are needed; and, two, that a performance-based approach was appropriate when implementing these standards.

IATA, along with other key stakeholders, will participate in an implementation initiative that will evaluate the feasibility of these proposed standards and provide guidance to both government and industry in terms of procedural gaps that may exist. IATA called on ICAO and its member States to move forward in such a way that does not result in premature, redundant, or unnecessary regulation.

There are some who believe that new equipment is needed on board air today to enhance aircraft tracking. IATA believes that the immediate focus should remain on leveraging the equipment already installed on aircraft. More importantly, IATA believes that there is an urgent need to ensure adherence to the existing, clearly defined roles and responsibilities of air navigation service providers for airlines.

Airlines are responsible for safely and efficiently carrying passengers. Air navigation service providers are responsible for maintaining safe separation and monitoring their airspace at all times. Furthermore, the air navigation service provider is the controlling authority managing routine and non-normal situations. As an example, an aircraft may deviate off track for a number of reasons, such as weather avoidance, vectoring for traffic, or for situations far more serious. In all cases, this responsibility and resulting timely action remains with the air navigation service provider. Air navigation service providers are also responsible for initiating alerts and search and rescue activities.

We believe that strict adherence to these roles and responsibilities will advance aviation safety more effectively and efficiently than layers of overly redundant mitigation. We also underscore the importance of these roles and responsibilities and procedural compliance not only throughout the implementation initiative, but as we continue to work with governments and other stakeholders to ensure the safety of global aviation.

IATA and its member airlines recognize that commercial aviation is not sustainable if the public does not have confidence in the safety of the global air traffic system. The credibility of our industry is at risk when a modern commercial aircraft vanishes while under air traffic control and that, in absence of the facts, speculation defines the accident.

What the airline industry will never allow is speculation about its No. 1 priority, the safety of its passengers and crew. Airlines remain committed to ensuring the safe and efficient operations of some 100,000 flights every day, and IATA will remain a vocal leader and strong voice in taking whatever steps are needed to honor this commitment.

Chairman Mica, Ranking Member Duckworth, distinguished members of the subcommittee, on behalf of IATA, thank you again for the opportunity to speak today.

[Prepared Statement of Mr. Hiatt follows:]

TESTIMONY

Kevin L. Hiatt

Senior Vice President, Safety and Flight Operations
International Air Transport Association

Before the Transportation and Public Assets Subcommittee
of the House Oversight and Government Reform Committee

Wednesday, February 25, 2015

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Soon after the disappearance of Flight 370, IATA brought together partners from across the aviation industry including airlines, air navigation service providers, pilots, manufacturers, the International Civil Aviation Organization (ICAO), and many other key stakeholders to undertake a critical review of current and future aircraft tracking capabilities and identify near-term options to improve those capabilities.

Throughout the summer and fall of 2014, this task force reviewed today's technologies, procedures, and best practices in terms of aircraft tracking. The task force found that most airlines track their fleets through a variety of means, including the vast majority who track through air traffic surveillance services—where they exist. We also verified that there are existing technologies, services, and procedures that can enhance aircraft tracking in the near-term and that a performance-based approach must be employed—there is no "one size fits all" solution. Established procedures must be followed and, where needed, improved to ensure clear, consistent, and timely communications between air navigation service providers and airlines. While the focus of the industry group was on the near term, it was recognized that emerging technologies will create new capabilities in the global air navigation infrastructure, including an improved ability to track aircraft.

The task force report was provided to ICAO in early December. ICAO incorporated its findings into their Global Aeronautical Distress Safety System (GADSS) document. GADSS is a concept of operations for routine, non-routine, emergency, and search and rescue situations. While these various stages are well defined in the GADSS document, IATA is concerned with suggestions that our industry should implement unnecessary solutions in the near term that will be more effectively addressed as more effective technology solutions are implemented over the next several years. For example, any deployment of Automatic

Deployable Flight Recorders would be redundant for airlines that implement real time data streaming.

On February 2-5, 2015, ICAO held a High Level Safety Conference. The agenda from that Conference addressed several key areas, including aircraft tracking, risks to commercial aviation in conflict zones, and sharing and protecting safety information. ICAO Member States concluded that (1) international standards for aircraft tracking are needed; and (2) that a performance based approach was appropriate when implementing those standards. IATA, along with other key stakeholders, will participate in an "implementation initiative" that will evaluate the feasibility of these proposed standards and provide guidance to both government and industry in terms of procedural gaps that may exist. IATA called on ICAO and its member States to move forward in such a way that does not result in premature, redundant, or unnecessary regulation.

There are some who believe that new equipment is needed on board aircraft today to enhance aircraft tracking. IATA believes that the immediate focus should remain on leveraging equipment already installed on aircraft. More importantly IATA believes that there is an urgent need to ensure adherence to the existing clearly defined roles and responsibilities of air navigation service providers and airlines.

Airlines are responsible for safely and efficiently carrying passengers. Air navigation service providers (ANSPs) are responsible for maintaining safe separation and monitoring their airspace at all times. Furthermore, the ANSP is the controlling authority managing routine and non-normal situations. As an example, an aircraft may deviate off track for a number of reasons, such as weather avoidance, vectoring for traffic, or for situations far more serious. In all cases, this responsibility and resulting timely actions remain with the ANSP. Air navigation service providers are also responsible for initiating alerts and search and rescue activities.

We believe that strict adherence to these roles and responsibilities will advance aviation safety more effectively and efficiently than layers of overly redundant mitigation. We will underscore the importance of these roles and responsibilities and procedural compliance not only throughout the implementation initiative but as we continue to work with governments and other stakeholders to ensure the safety of global aviation.

IATA and its member airlines recognize that commercial aviation is not sustainable if the public does not have confidence in the safety of the global air traffic system. The credibility of our industry is at risk when a modern commercial aircraft vanishes while under air traffic control and that, in the absence of facts, speculation defines the incident.

What the airline industry will never allow is speculation about its number one priority: the safety of passengers and crew. Airlines remain committed to ensuring the safe and efficient operations of some 100,000 flights every day and IATA will remain a vocal leader and strong voice in taking whatever steps are needed to honor this commitment.

Chairman Mica, Ranking Member Duckworth, distinguished members, on behalf of IATA, thank you again for the opportunity to speak to you today.

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Mr. MICA. Thank you, and thank you to all of our witnesses for their testimony. We will now turn to some questions.

First of all, Mr. Ambassador, I heard some timeframes cited as to when ICAO would actually institute a standard. Now, probably the most basic standard, and we just heard Mr. Hiatt talk about a requirement—well, first of all, about 95 percent of the aircraft already have equipment, that has a transponder so we can identify where the aircraft is, or some type of equipment where we have a transmitting device, is that correct?

Mr. Hiatt, is that correct?

Mr. HIATT. Not for the exact number, but you are correct, a vast majority having tracking equipment.

Mr. MICA. The vast majority. OK, so we have that. But the most simple thing would be to have a requirement in place as soon as possible that that be deployed, that that equipment be deployed. I think on 370 it was not deployed; it was on the aircraft, but not deployed. Is anyone aware of that, whether 370 had that equipment? I am sure it did; it was the most modern.

Mr. HIATT. MH370 was a Boeing 777, and it did have a transponder on board.

Mr. MICA. OK, so we will go back to the Ambassador. My initial question is, when will we have in place even the most basic requirement that this equipment be deployed and kept operational?

Ambassador LAWSON. Certainly. Let me go back and talk a little bit about what ICAO is trying to do and what the U.S. mission is trying to support.

What we have put forth for discussion among the member States is a performance-based standard.

Mr. MICA. Right.

Ambassador LAWSON. We are not prescribing any particular type of equipment. Why? Because, as you said, there are a lot of different technologies that meet this requirement; not all airlines have the same, but they basically have the ability to track their airlines.

Mr. MICA. So if they have it, the question is making certain they use it. We had an aircraft with 239 people that had it, and it wasn't operational.

Ambassador LAWSON. It is not that it wasn't operational. We don't know. The problem is we really don't know what happened with MH370.

Mr. MICA. Well, that is true.

Ambassador LAWSON. But the fact of the matter is what we believe is that it is not just the technology that we have to focus on, it is the technology and the coordination of the industry and the airlines and the air traffic control procedures.

Mr. MICA. But they weren't able to track the aircraft in a time in which we knew where it was when it went down. Then, when it went down, we weren't able to locate the aircraft because is it the transponder?

What do you have there?

Ambassador LAWSON. Well, as—go ahead.

Mr. MICA. What do you have there, Mr. Hart?

Mr. HART. This is the cockpit voice recorder. But is pretty much the same—

Mr. MICA. Is that what pings?

Mr. HART [continuing]. As the flight data recorder, and, yes, that is what pings underwater.

Mr. MICA. OK. But we didn't know where it went down and we couldn't locate it; it wasn't either operational or it didn't operate long enough.

Ambassador LAWSON. And it is precisely because we don't know exactly what went wrong that we are not prescribing specific fixes.

Mr. MICA. Again, I have to go back. We are stuck with all of us have to go back and say when will there be some action by ICAO to institute something. I heard some different dates. First I heard a date of later November this year, then November 2016. I heard another date of March. What is going to take place when as far as some standards?

Ambassador LAWSON. What is happening this week is that ICAO is sending out to its member States the proposal with respect to——

Mr. MICA. That is this?

Ambassador LAWSON. Yes. With respect to the performance-based standards that we want to have implemented. That is going out this week. We expect comments back from the member States and we are scheduled to take this up at the council level to make this formal in November of this year.

Mr. MICA. Not until November.

Ambassador LAWSON. Not until November of this year. We have to get responses back. But, in the meantime, we are not waiting on the formal responses to start an initiative to test out what will work and what doesn't work. It is not just the technology; it is how the technology is integrated with the processes that we have in place, and we are setting up an initiative in Asia that is going to be started late summer. FAA is going to be involved.

Mr. MICA. So we will be well into 2016 before that?

Ambassador LAWSON. Into 2015. Late summer 2015.

Mr. MICA. But well into 2016 by the time the standard is adopted.

Ambassador LAWSON. No. November 2015 is when we propose to adopt the standard.

Mr. MICA. OK. OK, I am sorry.

Ambassador LAWSON. Yes.

Mr. MICA. I kept hearing 2016.

Ambassador LAWSON. I understand your confusion, because this is like light speed.

Mr. MICA. OK. And, again, you said we are moving a lot faster than they have previously. Well, that is good. OK, well, that was my major question for you.

Mr. HART. May I add a point to that, Mr. Chairman.

Mr. MICA. Yes. In fact, O was going to ask you again not only this short-term solution. We heard about data streaming as another solution and global position satellites, which are soon, I guess, with Arion, 2017 will be in place.

Mr. Hart, could you tell us where we are there?

Mr. HART. Well, as Ambassador Lawson noted that we don't know why we stopped being able to see where that airplane was, and that is part of the reason why our recommendations included

exploring ways to make the systems tamper-proof, because we don't know whether they failed or were turned off intentionally. But that is why we have our recommendation.

Mr. MICA. So we don't know if it was a terrorist act; we don't know if it was mechanical failure; we don't know natural disaster due to storm or something like that. We really don't know.

Mr. HART. That is correct.

Mr. MICA. And you told me, I think, the other day when I visited, the long-term solution for identifying where an aircraft is in the global network. And I believe Arion is about, let's see, Iridium was going to launch these satellites and now Arion has 81 of them going up, and they should be launched globally, 81 of them, I believe, in 2017. And that would solve part of the problem?

Mr. HART. That would aim at the tracking problem. We also would like to get more data so that, if we lose an airplane underwater, we don't have to go underwater to find out what went wrong. So it is several aspects.

Mr. MICA. One of the problems we have is that usually the pinging device goes out after 30 days. Are you recommending that that be changed so we would have a longer period to search for these aircraft?

Mr. HART. Yes. We included recommendations not only to increase the time from 30 days to 90 days, but also to change the frequency to a frequency that can be tracked for a much greater distance than this pinger.

Mr. MICA. And data streaming, are there existing tracking capabilities over sea and land to have data streaming work now or does that rely on a global network, satellite network?

Mr. HART. Sort of all of the above. The ability to track is very good if you can't turn it off. That was our problem with MH370, we lost the signal and we don't know why. So that is one of the challenges, is, was it turned off intentionally.

Mr. MICA. OK. Well, that is interesting. But you could make changes to the equipment, I know nothing about the technology, that would not allow it to be disarmed or disabled?

Mr. HART. Our recommendations have asked for the FAA to explore ways to make those systems tamper-proof, that is correct.

Mr. MICA. OK. OK. And you have a total membership in IATA of about 84 percent of the airlines globally, is that correct?

Mr. HIATT. Pretty close, yes, 250 members.

Mr. MICA. Now, Malaysia Air was obviously a member.

Mr. HIATT. Correct.

Mr. MICA. So I can't say that the problem is just among the 16 percent, because here we have an example of a sophisticated aircraft, a member of the highest level operation I would consider your membership of airline operators, and we still have a problem. The only other thing is I understand there is some dispute about the size of the aircraft, the number of passengers. Was the proposal at 16 or something?

Ambassador LAWSON. The proposal that ICAO is setting forth is that these rules would apply to any aircraft with more than 19 passengers.

Mr. MICA. Nineteen passengers. OK, very good. Well, most informative. Thank you all.

Let me turn now to our ranking member, Ms. Duckworth.

Ms. DUCKWORTH. Thank you, Mr. Chairman.

So I know just enough about this issue to be of danger to myself and others, and I am getting a little bit confused.

Mr. Hiatt, could you just address the different issues of, just very briefly, the different transponders? You know, we are talking about here in the U.S. we are going to 80 SB. I understand what you are saying about there is no need to spend more money on equipment if you already have something that is capable of doing it or that is redundant. I own a 1959 Piper Comanche that my husband and I bought. We paid more for our 2006 F-150 than we did for the airplane, just to give folks an idea of how old this aircraft is.

And it was, when we bought it, it was fully, fully, I mean, it was a sweet, sweet panel for 1972. It had LORAN and all that good stuff, but there is still equipment in there. My six-pack is still perfectly good. I don't need to upgrade that into a glass cockpit; it works just fine. We did just now invest in ADS-B Out in our nav com.

I guess what I am trying to ask you is all of your membership have some form, right, of ADS-B Out, an extended squidder or 1090ES, or something along those lines, is that not correct?

Mr. HIATT. Your analogy with your aircraft is very accurate, especially when you talk about LORAN. I learned on LORAN; but we are dating ourselves. Anyway, to go back to your question, your assumption is that, yes, all of our carriers do have a transponder. There are updated transponders that are now coming into effect. Not to get too technical, but they will allow the ADS-B, ADS-C, which is contract information out.

Now, not all airlines have the same equipment and the availabilities worldwide. If we think about in the United States, it is very sophisticated. But when you get into other regions of the world, it is not quite as sophisticated, and those airlines have adapted their operation to the region that they are in, so it dictates what type of equipment they would have onboard.

Ms. DUCKWORTH. So there would actually conceivably be airlines, say throughout the Pacific Islands or throughout Asia, that don't have a 1090ES or some level of a squidding position reporting system?

Mr. HIATT. Potentially, yes. But most of them all have the transponder. But there is the transponder with the 1096 squidding availability that will be put into place that will allow you to take advantage of the ADS-C, ADS-B type operation.

Ms. DUCKWORTH. Is your organization supportive or are you taking a wait and see or are you opposed to ICAO saying that we should have that squidding capability in all aircraft that are carrying passengers in international airspace?

Mr. HIATT. What IATA is in favor of and is very strongly for our airline members is a performance-based approach, as the Ambassador had said, and that performance-based approach will allow us to develop what is the best in technology and utilize several different technologies. You know, we are talking about ADS-B, ADS-C. We also have other technology that is available, and what we want to do is make sure that there isn't a regulation that might

come out that would specify exactly what you need, because you may be able to take advantage of better technology along the way.

Ms. DUCKWORTH. Oh, I absolutely agree with you on that. But I think I am speaking to a capability here.

Mr. Ambassador, would it not make sense to have a performance-based standard that says that all aircraft that carry passengers, especially in international airspace, over international waters, as in the case of Malaysian Airlines, have some sort of system, whatever that technology is, that is capable of squidding or extending squidding, which is sending out bursts of position data continuously, without having the aircraft to be interrogated by radar first?

Ambassador LAWSON. That is exactly what we are proposing. The specific terms that you are using are not in the document that has gone out this week, but that is the concept; that you figure out what kind of technology you have, what kind of technology is available, and we coordinate the processes with the air navigation service providers and others, search and rescue, so on and so forth, so that we all know how to work these things together. But that is exactly the process that we are embarking on at this point in time, that is exactly right.

Ms. DUCKWORTH. And I don't know who would answer this, whether Mr. Hiatt or the Ambassador. With military aircraft that would be launched or sent out there, you know, radar basically tells you where to go. Say you are trying to intercept an aircraft, for example, a non-responsive aircraft or something, and you are sending military aircraft.

In the U.S., radar would tell you where to go to find these guys, but if you are over international waters out there where you are in, I mean, none of it is uncontrolled, but do they have the capability of receiving the data in some of these aircraft in the military so that they can go find an unresponsive aircraft or an aircraft that is gone missing, as in the case of Malaysian Airlines?

Ambassador LAWSON. You are talking about a level of analysis that we are not at yet. Right now we are talking about getting everybody on the same page in terms of normal tracking and abnormal tracking, and you are talking about distress tracking at that point.

We are working on all three of these levels, and, again, this is a performance-based standard that we are trying to use and we are going to utilize every, or as the Ambassador to the U.S. mission, I will do what I can to push ICAO to utilize all of these technologies and make sure that we don't leave any space uncontrolled, if you will. Not controlled, but that we identify the various possibilities that you have identified and say what would we do in this situation, what would we do in that situation. The first such initiative, the first such test will take place in the summer of this year in Asia. The FAA will be involved. We are going to involve IATA, NTSB. We are going to make sure that everybody who would have a hand in an actual situation has a hand in figuring out what the procedures should be. So the questions that you ask are the questions that are going to be asked, and hopefully we will get some answers.

Ms. DUCKWORTH. Thank you, Mr. Ambassador.

I yield back, Mr. Chairman. You have been very generous.

Mr. MICA. Thank you.

Mr. DeSaulnier, the gentleman from California, you are recognized.

Mr. DESAULNIER. Thank you, Mr. Chairman. I am slightly more dangerous, I suppose, than the ranking member, or maybe more, because I know really nothing about this other than the fact that I am flying a lot more often, so I am more concerned about this issue coming back and forth from the San Francisco Bay area most every weekend.

Mr. Hart, nice to see you again.

Mr. HART. Thank you. The pleasure is mine.

Mr. DESAULNIER. Well, it is mutual. Maybe it is like Claude Rains and Humphrey Bogart in Casablanca; I hope this is the beginning of a beautiful friendship.

So as someone who is not familiar with the technology, but is from an area that prides itself on new innovation, it seems to a layperson that it is sort of hard to believe that we don't have more refined technology. In January you mentioned that it really shouldn't be, if I am reading the question properly, to obtain critical flight data faster, you really shouldn't have the need for immediate underwater retrieval.

So this is directed at you, but if either of the other panelists want to chime in. So are there constant technological improvements? Have these crashes, including the 2009 Air France Flight 447 crash, has this started to encourage or incentivize new technologies and how close are we? You have mentioned near-term, medium-term, long-term. Maybe a little more specific as to how we get to the long-term as quickly as possible so you don't have to spend all these resources trying to actually get the box back.

Mr. HART. Thank you for the question. New technologies are developing rapidly. The issue, as you have already heard several times today, is the implementation internationally, because not only does it need to be approved by the regulators in the significant countries, but then they have to harmonize that so that the borders are transparent. So the challenge is getting 191 countries to agree to where to take this, and that is one of the reasons that we stress performance-based, because there are so many different scenarios depending on the situation.

Mr. HIATT. I will just add, Congressman, that the industry is very onboard with looking at streaming data. We do recognize, though, that the automatic deployable flight recorder will go into effect, but we also feel that the technology is moving so fast that it will help the NTSB and in accident investigation to have that streaming data.

Mr. DESAULNIER. And just incentivizing from the private sector's perspective, are there liability issues? I mean, obviously, there is good will and the confidence of the flying public, but are there other things that are impelling more R&D to make the technology be deployable faster, or is it mostly just getting multiple jurisdictions and countries to agree to the technology, as you just Stated? Mr. Hart?

Mr. HART. It is some of all of the above, because the incentives, ultimately the incentives are that, as the technologies advance, they are going to help the airlines be able to operate more effi-

ciently through continuous knowledge back and forth. That is going to be, ultimately, a very strong incentive. But certainly getting everybody to agree is a major, major challenge.

Mr. DESAULNIER. OK.

Thank you, Mr. Chairman. I yield back.

Mr. MICA. Thank you.

Welcome and recognize Mr. Price. Mr. Price, Ms. Duckworth put your full Statement in the record, but you are recognized for questions.

Mr. PRICE. Thank you, Mr. Chairman. I appreciate the chance to sit in on this hearing today on a matter of long-term interest for myself and Mr. Duncan.

I want to congratulate Ms. Duckworth on her assuming the leadership role she has and also, of course, welcome her back to the Congress.

I do appreciate your hospitality here today and the chance to ask a couple questions. I know my full Statement was submitted in the record. This Statement reflects work that Representative Duncan and I have done for many years, and the two bills that address flight tracking and data recovery, the SAFE Act, which would require the use of deployable recorders, and the SAFE-T Act, which would much more broadly require FAA to take a close look at all the technologies on the table and develop domestic requirements in line with international standards.

Ambassador, I understand, before I arrived, you talked about the unaccustomed speed with which ICAO was acting on this matter to act post-Malaysia 370, but I do have to note that this is not a new matter in this body, and the discussions have been going on for years, including discussions in your organization.

At least since Air France 417 these discussions have been going on. Representative Duncan and I have introduced these bills multiple times; we have had report language in appropriations bills, most recently 2014, then again in the current year, encouraging the FAA to consider the costs and benefits of deployable recorder technology to work with the NTSB to support U.S. and international initiatives in this area.

So this isn't new, but fortunately it does seem to be reaching a heightened level of attention, so hopefully we can sort through the different proposals and do something that actually makes a difference in something that does seem, to the layman, I think, seems just obsolete that we cannot deal with these aircraft that go down, that we never find in some cases, or in any case have these expensive, heart-wrenching searches that, surely, given the technology we have and have actually deployed on some of our military aircraft, surely this isn't necessary.

Now, I am pleased to see that ICAO's tracking recommendations are coming in conjunction with or viewed as a complement, let's say, to automatic deployable flight recorders. That is a proven technology. I understand that you are currently moving forward to make the use of the deployable flight recorders a recommended practice. Is that accurate? And the timetable you gave earlier, does that apply to this recommendation in particular?

Ambassador LAWSON. The recommendation that we have on the table is performance-based. Deployable flight recorders is a possible

solution that would meet that standard. Currently, the letter that has gone out does not specify any particular type of technology, but that is clearly part of the technology that we would expect to be implemented.

Mr. PRICE. All right, that leads me to our other two witnesses, and since I have limited time, let me just explore this a little further with them, the complementarity of these systems.

Mr. Hiatt, you actually Stated that deployable recorders would be redundant for airlines that planned to implement real-time data streaming. I wonder about that. Could you clarify? Are airlines that use real-time data streaming transmitting exactly the same number of flight data and cockpit voice parameters that a standard or deployable black box is required to record for accident investigations? What happened to triggered data or real-time streaming if onboard satellite equipment suddenly loses power or if the aircraft loses its lock on the satellite?

And then, Mr. Hart, of all the technologies being discussed, which ones work after the crash has occurred: automatic distress tracking systems, real-time data streaming, deployable recorders? Clearly, that is available after the crash has occurred; it ejects on impact, it is right there. Does equipping aircraft with automatic tracking capability guaranty that it will provide the actual position of the aircraft after it goes down?

You see what I am getting at? What are the distinctive features and distinctive strengths of these different technologies? Are they, in fact, redundant and, in particular, what are the capabilities of the deployable recorders. That is obviously what I am getting at. And I would appreciate both of you responding.

Mr. HART. The specific recommendation that we made regarding finding aircraft that have crashed is that they, when in distress, are doing something that makes it possible to locate them within six miles after they crash. There are so many ways to do that. We didn't specify specifically a way to do it, we just said we want to be able to find the aircraft within six miles of where it crashed so that we are not searching the entire Indian Ocean.

Mr. HIATT. On the equipment and, as you would say, the redundancy, it would actually be duplicative in terms of the fact that we already know that the flight data recorder and the cockpit voice recorder will remain on the aircraft. What we are looking at is the technology to harvest that information sooner in order to be able to analyze what happened in the particular event.

Now, as far as locating the aircraft, streaming data is a byproduct of tracking and could be utilized by the airline itself.

Mr. PRICE. That is the point, though, isn't it? Yes, the recorder is there, but the recorder is at the bottom of the sea.

Mr. HIATT. So, with the streaming data, it already starts to point to what has taken place while the recorders are being recovered. If you go back and look at the history on the Air France 447 accident, there was a lot of information that was harvested within the last, really, 20 minutes of that flight that helped to find out where that aircraft was while, unfortunately, the flight data recorder and the cockpit voice recorder were still trying to be located.

Mr. PRICE. Yes. And what I am asking you is are these kinds of data, the kind of streaming data you are describing and the data

that would hypothetical be available had the black box ejected and floated, are those literally redundant?

Mr. HIATT. It would depend upon the parameters that we are actually required to provide to the authority, such as, in this case, the FAA, as far as the number of parameters that we would have tracked on the aircraft, which then goes back to the NTSB or the investigative authority as to the usefulness of the data. There are certain amount of parameters. We have progressed over many years, as you well know, with going from basically 10 parameters that you are looking at a tin disk now to volatile data and all the other things that can be harvested. So there are the basics and then there are those in addition to.

Mr. PRICE. Well, thank you, Mr. Chairman. I know my time has expired. The bills that Mr. Duncan and I have put forward certainly anticipate and would promote the consideration of this full range of techniques and gathering methods. But I think we also obviously are motivated by a conviction that the proven technology that would instantly provide location of a downed aircraft, there is a certain burden of proof on those who would say they could replicate that or render it redundant.

Yes, sir?

Ambassador LAWSON. I just wanted to say that these are specifically the types of questions and concerns that I will bring back to ICAO through our mission as we progress through our initiative and see what works and the procedures that will be in place. These are exactly the types of questions we are going to make sure that we get some answers to.

Mr. PRICE. Thank you.

Mr. MICA. Mr. Price, just a question, if you would yield. Your proposed legislation you and Mr. Duncan put together really is triggered by ICAO, isn't it, by ICAO action?

Mr. PRICE. The short answer is yes.

Mr. MICA. OK.

Mr. PRICE. We have had these concerns for a long time. The National Transportation Safety Board in our own Country, for years, has had this under advisement, has explored this. But, yes—

Mr. MICA. But you still had to wait for them to—

Mr. PRICE [continuing]. We are latching on to the ICAO process, yes, that is true.

Mr. MICA. And one of my concerns is I was trying to get the timeframe, and even if we get to November and they adopt it, I saw this document that came from the ad-hoc working group from ICAO, and it says how long would it take for States, that would be the countries, and industries to implement this proposal. And then the chart says there are two to 5 years. That is just aircraft tracking. And more than 10 years for ADT and ADFR.

Is that accurate? I guess that is their estimate. So even if we are adopt it at the end of the year 2016, we are looking at two to 5 years, 18 onto 20, 2023 or something before this is implemented.

Ambassador LAWSON. That is the current timetable that is in this document. We are at the beginning of this stage. We are at the beginning of the process.

Mr. MICA. So, Mr. Price, we still have a long way to go.

Mr. PRICE. Well, let me just, in response to the way you put the question, though, our legislation does not depend on ICAO action; it is action that our Country would take. And we have urged repeatedly our own FAA to move forward in considering this. But, yes, we do anticipate conformity to ICAO standards.

Mr. MICA. Well, the other thing, too, is, OK, we have I guess they are all corporate members of your organization, IATA, and you have 250 members. What is your current standard? Because you don't have to deal with the cumbersome process of implementing, and you had a member, Malaysia Air, who obviously didn't have functioning equipment. We don't know what the reason was, whether it wasn't operable or was made inoperable. What is your current standard? Can't you implement something right away, or have you, and what is your current standard?

Mr. HIATT. Well, as I mentioned in my testimony, Congressman, we have the IOSA registry, which is a standard that every one of our 250 members has to abide by.

Mr. MICA. Now, is that before March of last year?

Mr. HIATT. Oh, yes.

Mr. MICA. So they weren't complying? Then Malaysia Air wasn't complying, or we don't know if they were complying?

Mr. HIATT. We can't say whether Malaysia Air was in "standard compliance" or not because we really don't know exactly what happened.

Mr. MICA. Do you have any enforcement capability?

Mr. HIATT. The only enforcement capability really is the fact that their name or their organization, if they don't make the standard through their biannual audits, would be removed from the registry, which also then results in them being removed as a member of IATA.

Mr. MICA. And we would have the capability of passing a law that mandates that FAA require this on any domestic aircraft or any carrier coming into the United States. I think we would have that capability.

Mr. PRICE, Ms. Duckworth, wouldn't you think?

Ms. DUCKWORTH. Yes.

Mr. MICA. So maybe that might be a motivator.

We have aircraft now flying in from your organization that are in non-compliance? I said almost all the aircraft had the technical capability of compliance, and you agreed to that.

Mr. HIATT. That is correct.

Mr. MICA. OK. Are you aware of any that are coming in that belong to your organization that don't have that capability?

Mr. HIATT. No, because—

Mr. MICA. So if Mr. Price, Ms. Duckworth, and I, we introduce our bill that requires that any aircraft that comes into our domestic flight operations area have this equipment, that it be operable, and that it have certain requirements, performance, you wanted performance, you don't have a problem with that.

Mr. HIATT. Well, I am not sure if I have a—when you say a problem with that, I am sure my members would definitely raise their eyebrows on it.

Mr. MICA. It might be coming. You might alert them, because when you go back now, and I love cooperating with ICAO trying

to get this, they have 191 countries to deal with, all of them at different levels with different agendas, but we have an obligation to the American public. We are representing the United States.

We also put 25 percent in the paying for ICAO, and we need some certainty that aircraft—and usually we set the standard, and by the standard we set the rest of the world usually complies or they sure as hell ain't gonna fly in. I mean, we went through this with the European Union's mission trading scheme. They impose on us, when we get to their border, or they wanted to impose from our airport to their landing cite in the EU certain restrictions and requirements. We sure as heck can require standards for those flying into the United States if they want that, right, Mr. Hart? You don't have to approve the proposal, but you would confirm that we have that ability.

Mr. HART. I believe we have that ability, I am not sure. But the problem is not in the U.S.; the problem is elsewhere in remote locations. That is where the problem occurs.

Mr. MICA. That is true, but, again, we would set a standard for which we would hope the others would comply. And, again, we can't assure everything in the world. We are trying to work with our Ambassador; he is trying to work with those 191 countries. But, again, we are looking at November, then we are looking at two to 5 years. I am trying to speed the thing up. He is doing the best he can.

The other thing, too, is we haven't passed a resolution from the House or Congress, and I am not sure if that would help any. I know we sent letters up to ICAO; we have met with the president of ICAO and he is cooperating. But what we are trying to do is get this in place as soon as possible.

It is always good to have some institutional knowledge, but to hear Mr. Price and Mr. Duncan, well, we have been working on this for years. They are ahead of the curve, but we are not getting to the——

Mr. PRICE. That is right, Mr. Chairman, and we have had, for years, referenced the interest in ICAO and whoever else was working on this, but we have always anticipated that our Country should lead, our Country should set the standard.

Mr. MICA. I might say, and I will tell you today I may look at some legislation to move this forward, even if it is only for setting a U.S. standard. We have always been the leader. We need to maintain that leadership role. We also need to help set the standard for the rest of the world. And there will be Americans flying on some of those planes around the globe. We can't guaranty all this in place instantly, but I think we can motivate and initiate action that will light a fire. Sometimes you have to do that.

So that is the end of my questions.

Madam Ranking Member, you are recognized.

Ms. DUCKWORTH. Thank you, Mr. Chairman. You know, I represent a district of manufacturers and small business owners, and I find, oftentimes, that industry can react far faster than governments can, and sometimes government does need to get out of industry's way and allow them to implement things that are going to be good for the industry and good for their customers, as well.

With that, Mr. Hiatt, I just want to give you an opportunity to talk about your aircraft tracking task force and the near-term aircraft tracking recommendations that your organization is saying should be implemented even before the new ICAO recommendations can be put into place. So can you talk a little bit about some of those recommendations coming out of the task force?

Mr. HIATT. Sure, Congresswoman. We took a very detailed look at all of the options that were available in technology; there were over 27 submissions from different manufacturers in different areas of the world to tell us what they could do to track an aircraft.

What we looked at in that sense was the fact of how soon any of these could be implemented, and it really got down to about literally five or six things that we could do as an industry right away with the aircraft and the existing equipage, as you went back and we were talking about the transponders and the squidder.

But it could be, as I would say, and please excuse this word, primitive as nothing more than a VHF or an HF voice communication to let the controlling entity know where you are. Now, the controlling entity be either the airline or the air navigation service provider.

Now, technologically speaking, is that advanced? It is something that has been used for years and will continue to be used for years; it is still being used in Africa and it is still being used in certain places in oceanic airspace. So with ADS-B, ADS-C, and then VHF capabilities and then other tracking capabilities that come along with ACARS on board your aircraft, those are the ones that our members can actually take advantage of right now.

Ms. DUCKWORTH. OK. Well, I understand what you are saying about the low tech sometimes works out better. When we were flying in Iraq, in fact, the U.S. Army was using Blue Force tracker, which is GPS-based, which never worked in that thing, which is a dead computer taking up space in my aircraft; and we in fact used HF to communicate with each other all throughout the country and something that has been around for a long time. So I understand.

Ambassador Lawson, you have a thankless task. You are hurting cats over there and I understand the challenges that you are facing. I guess what I want to know is what can we do to be helpful to you, as you represent the United States in ICAO, to help you help push these standards further along, and what can we do here as Members of Congress to assist you in the work that you are trying to do?

Ambassador LAWSON. Thank you for the question and thank you for the offer. This opportunity to express your concerns goes a long way. The United States is one vote on a 36-member council, but our influence is greater than that; and to be able to go back and tell other members of the council, tell the president of the council, the secretary general that the intense interest of this Congress, of this committee, of your voices as to what needs to be done and what needs to be done quickly will go a long way.

I am somewhat concerned about the possibility of kind of the Balkanization of different rules that go beyond what ICAO requires in terms of international airspace. The United States has complete control over its own airspace and we should continue to do that and we will not relinquish that, but what we are talking about is, as

Mr. Hiatt said, flights over oceanic areas, over remote areas, this is where the danger occurs; and we are concerned about U.S. passengers who are flying on non-U.S. airlines.

And ICAO has done a remarkable job over the years of focusing on its primary goal, the safety and security of worldwide civil aviation, and it has done a remarkable job at that. It is plodding at times; it is frustrating at times, and hurting cats is a great analogy. But make no mistake, your voices are heard and I will make sure that your voices are heard throughout the halls of ICAO, and that is a very good help to me.

Ms. DUCKWORTH. Thank you.

I yield back, Mr. Chairman.

Mr. MICA. Just finally, Mr. Hart, as I craft this legislation to move forward, let me ask you a question. First, you don't want to do things that impose hardship on industry. One, equipment already exists with the transponder. Part of the problem is keeping it on. Is there a problem or great expense to enable a flight recorder to stay on?

Mr. HART. Thank you for the question. The challenge is not necessarily the expense, the challenge is that any time you have a system that may go bad, you don't want that system's badness to infect the rest of the airplane. So that is kind of the challenge of making it so it can't be turned off. Yet, we are moving in that direction because the FAA has certified, recently, various airplane designs that do have—

Mr. MICA. So if my bill says it has to stay on, they have to take technical capability of making it stay on without great cost or possible issues of bad things happening.

Mr. HART. We are on the learning curve of figuring out how to do that, and the big challenge—

Mr. MICA. So if I give them, like, a year to comply, they could probably deal with that.

Mr. HART. I couldn't specify a timeframe, but we are moving in that direction.

Mr. MICA. The other thing, too, is to get more than 30 days pinger. I think when I was there you said that there is a capability of making some adjustments so that most of the existing equipment could have a longer transmitting life?

Mr. HART. I would have to get back to you with respect to that. I am not sure of the answer to that. I know that we can make equipment that has 90-day capability. Whether I can take this one and modify it to make it—

Mr. MICA. Can you give us that answer?

Mr. HART. I would be happy to get back to you.

Mr. MICA. Again, I am not trying to impose something on industry that would be great cost. I would imagine, again, within a year or we give them a year and a half, whatever, to make those changes. But I am trying to get from a technical standpoint what can be done, and if I impose it on those flying into the United States, their equipment, you don't want undue hardship or not putting something in there.

Long-term, though, is really global positioning satellites and that continuous streaming of data, and that won't be in place for it is beyond 2017. I think their launch schedule is 2017?

Mr. HART. That will take a while. I don't know the specifics on the timing of that, but that will certainly take a while, yes.

Mr. MICA. OK.

Mr. HART. And I would be happy to get back to you with what can be done with the existing pinger to extend its duration.

Mr. MICA. OK. OK. And then, finally, IATA, voluntarily implementing your cooperative members, say, latest standards or standards that would cover most of what we have talked about, what would be the schedule for that?

Mr. HIATT. The current standards that we are talking about coming out of ICAO at the moment?

Mr. MICA. No, anything you could do to implement higher standards.

Mr. HIATT. Well, we are encouraging our members now that if they have equipment that is able to track aircraft, that they use it that way.

Mr. MICA. You are just sending out suggestive memos?

Mr. HIATT. It is coming through our committees, that we put that information out to the——

Mr. MICA. With the capability for membership to meet certain standards?

Mr. HIATT. Well, they have to meet certain standards through the IOSA registry, as I mentioned.

Mr. MICA. Right.

Mr. HIATT. Now, we have certain standards in the IOSA registry about flight following, but not flight tracking. So as we see——

Mr. MICA. Do you intend to adopt any measures?

Mr. HIATT. As we see what comes from ICAO——

Mr. MICA. So you are going to wait on ICAO.

Mr. HIATT. Well, it has to act in——

Mr. MICA. I have to take my bill to do something.

Mr. HIATT. Let me make one point. I know you want to get your bill in, and I understand that the urgency is there, but I will say that we operate over 100,000 flights a day successfully. No. 2 is we recognize that the leaders in the world, such as the United States, have great technology, and they will obviously require more. But we have members from all over the world, and what we do want to avoid is making sure that I don't have five or six or seven different black boxes that are regulated by different entities all over the world.

Mr. MICA. No. And I don't want to do that. But right now we do have one of your members who was flying an aircraft, it will be a year ago next week. We don't know where it is; we don't know where 239 people are. It wasn't a second-rate aircraft or equipage. But something happened to deny us knowing where it is or being able to locate it, and this is 1 year later.

I heard Ms. Duckworth, she also, in her own way, said I can't imagine being a family member. It is bad enough for industry, but for people to not know what happened. We should know, and every aircraft that carries that many people—I know the rule deals with 19, but passenger aircraft, again—and we can't, maybe, rule the world, we don't intend to, but we have some leverage over what comes in and out of the United States, and also the obligation to set the very best standards. So we will look at that.

I will wait to hear back from Mr. Hart as we craft it.

Did you have something to say, Mr. Lawson?

Ambassador LAWSON. I just wanted to add a note that I applaud your approach, but it is not just technology that is going to solve this problem; it is the procedures that are in place with respect to the technologies that exist and that are going to exist. So all of that needs to be coordinated.

Mr. MICA. Well, we have a voluntary private organization and we can adopt standards. And, again, we won't know until we see what happened with 370, but we can take steps. They can take steps voluntarily; we can mandate where we have U.S. jurisdiction. You have to deal in a different venue, and we know you are doing your best.

But even with all that said, it is going to be years and years before we have this rule and then we have the implementation of the proposal, so we are just trying to light a little fire both by the oversight hearing that we are conducting, working with you, the industry, and the technical people, because the last thing you want to do and I want to do is impose things on industry that aren't practical or would impose great cost, inconvenience, or duplication.

Well, I thank each and every one, especially our ranking member. Just really pleased to have her back. Again, congratulations.

Thank each of you for your testimony today. We will leave the record open.

There being no further business before the subcommittee, this hearing is adjourned.

[Whereupon, at 11:30 a.m., the subcommittee was adjourned.]

APPENDIX

MATERIAL SUBMITTED FOR THE HEARING RECORD

**Statement for the Transportation and Public Assets Subcommittee of the
House Committee on Oversight and Government Reform
Ranking Member David E. Price (NC-04)
T-HUD Appropriations Subcommittee
February 25, 2015**

Mr. Chairman, thank you for the opportunity to join in this important hearing as you consider aviation safety, flight tracking, and data recovery reforms.

It has been nearly one year since the disappearance of Malaysia Air 370, and a search continues for the aircraft, its recorders, and its passengers. In 2009, when Air France 447 crashed in the Atlantic Ocean off the coast of Brazil, killing more than 220 people, it took several days to locate the wreckage and nearly two years to find the underwater debris field. Following the crash of AirAsia 8502 in December 2014, it took about two weeks to recover the black box information.

These tragedies, and the costly searches that followed them, all underscore the need for international standards of flight tracking and the transmission and recovery of flight data. To that end, Congressman Duncan and I have re-introduced two bills that would improve flight tracking and the recovery of in-flight data.

The Safe Aviation Flight Enhancement (SAFE) Act would require the installation of floating "Black Box" data recorders on domestic commercial aircraft. These recorders collect cockpit voice recorder and flight data recorder information in one crash-survivable box that ejects on impact and then immediately transmits a signal identifying the location of a crash site. We know that these deployable recorders work because they have long been used on military aircraft around the world.

Deployable technology, used in conjunction with traditional fixed black boxes, can help ensure rapid, reliable and secure access to complete black box data and downed aircraft localization, which are critical to safety and security investigators. Deployable black boxes also are able to integrate other emerging, complementary technologies, allowing them to serve as a platform for the next generation of flight data collection capabilities.

The Safe Aviation Flight Emergency Tracking (SAFE-T) Act would require passenger aircraft to be equipped with tracking technologies that allow us to identify when aircraft experience abnormalities or distress and more quickly recover information when accidents occur. The data provided by this tracking technology would not only prove invaluable to investigators in the search and recovery process, it could also help aviation engineers learn from these tragedies and build safer aircraft.

The SAFE Act and the SAFE-T Act would implement recent policy recommendations of the National Transportation Safety Board and bring domestic aviation regulations in line with international standards, which is the goal of this hearing. The U.S. government has a responsibility to lead the implementation of new standards for flight recorder and distress tracking upgrades, and our legislation represents the common-sense reforms that could help us avoid compounding the tragedy of aviation accidents with costly, time-consuming searches.

I thank the Members of this Subcommittee for the important work that you are doing on aviation safety, and I hope that you will consider lending your support to our legislation.



Chairman John Mica	Ranking Member Tammy Duckworth
House Oversight and Government Reform Committee	House Oversight and Government Reform Committee
Subcommittee on Transportation and Public Asset	Subcommittee on Transportation and Public Assets
2157 Rayburn House Office Building	2157 Rayburn House Office Building
Washington DC 20515-6143	Washington DC 20515-6143

Subject: Hearing on Preventing Another MH370: Setting International Standards for Airline Flight Tracking,
 Date: February 25, 2015

Dear Chairman Mica and Ranking Member Duckworth:

On behalf of Inmarsat, I am pleased to have the opportunity to submit this statement for the record to the House Government Reform and Oversight Committee, Subcommittee on Transportation and Public Assets hearing on Preventing Another MH370: Setting International Standards for Airline Flight Tracking held on February 25, 2015.

The disappearance of Malaysian Airlines flight MH370 was a tragic event that caused a devastating loss of lives and property with impacts around the world. As the global leader in satellite communications, whose core foundation is maritime and aviation safety, Inmarsat applauds the committee's initiative to examine this complex and urgent safety issue.

Inmarsat has a unique perspective of this event as from the onset a team of Inmarsat specialists have been at the forefront in assisting the Investigation Team in the search for the missing airliner. This has involved analysing the information contained within the communication logs recorded at the Inmarsat Perth Ground Station. These logs record the network activity transmitted over the satellite network between the Ground Station and the satellite communications terminal on the aircraft. To this day, nearly one year later, our team remain engaged in their role as technical advisors to the international Investigation Team. This is a testament to our commitment to help bring closure to the families impacted by this tragedy. Inmarsat remains focused on supporting all aviation stakeholders to achieve the most effective outcome.

As a prime example, I offer that Inmarsat's global flight tracking capabilities are currently being tested in support of the International Civil Aviation Organization (ICAO)'s efforts to achieve a global tracking standard. As your Committee moves forward with legislation to address this important safety issue, Inmarsat would like to highlight, that as of today, the marketplace can provide a proven performance-based capability that will not incur a significant cost burden to the government, industry or consumer.



Space-based Automatic Dependent Surveillance-Contract (ADS-C) is an existing and reliable position reporting and aircraft tracking technology in use today by most oceanic commercial transport aircraft. It is a technically feasible and available solution that can readily meet the standards and timeframes proposed by ICAO in the near term by many of the world's aviation operators and authorities. This advanced navigation and surveillance is being used on more than 11,000 (90% of the oceanic fleet) satellite communication equipped commercial aircraft today. ADS-C is available and is being evaluated to ICAO standards for global flight tracking. This capability on the aircraft is backed by a constellation of reliable satellites that are already in orbit, tested and certified and can deliver near and long term global flight tracking solution.

The remainder of this statement provides more supporting details regarding Inmarsat, the company capability, and participation in the ICAO standards setting process.

About Inmarsat

Inmarsat has provided global mobile satellite communications connectivity for people and organizations in the most remote locations on Earth for more than 35 years. On land, at sea, and in the air, Inmarsat's satellite services deliver robust voice and high-speed data for mission critical government and enterprise customers alike. Inmarsat pioneered 'safety-of-life-at-sea' services to the maritime sector and oceanic surveillance and communication services to the aviation sector.

Alongside Inmarsat's existing award-winning legacy satellite connectivity, Inmarsat is investing US\$1.6bn to deliver Global Xpress – the world's first global, mobile, high-speed broadband service delivered by one operator that we expect will be available in the second half of 2015, including hundreds of highly technical and high paying American jobs throughout the communications and aerospace industries.

Inmarsat Aviation

Inmarsat has provided highly-reliable connectivity and safety services to the aviation community for over 20 years. Today, Inmarsat's services are being used on more than 11,000 (90% of the oceanic fleet) satcom equipped commercial aircraft. Inmarsat's existing satellite networks enable routine communication, flight tracking and surveillance, which are fundamental to safe and efficient operation of aircraft throughout the world. Our equipment provides air traffic surveillance in oceanic airspace and helps controllers effectively manage the airspace to provide the most fuel-efficient and environmentally beneficial oceanic flight paths. Messages are automatically forwarded to airline operations centers to enable flight following by dispatchers. In addition, pilots are able to receive real-time weather information and maintenance issues that can be manually and automatically downlinked to ground staff using the satellite enabled links.

Inmarsat was the first satellite operator to receive aviation satcom approvals under guidance contained in the Initial Future Air Navigation Systems Operations and Manual, Eurocontrol LINK2000 and more recently, the Global Operational Data Link (GOLD) document.

***The search for MH370***

Inmarsat engineers played a key role in assisting the international Investigation Team to determine the search area containing the likely final location of MH370. Despite contact being lost with the aircraft, a number of network signalling messages continued to be exchanged between the Ground Station and terminal on the aircraft, from which estimates of the distance from the satellite and likely aircraft heading could be calculated. These signalling messages continued to be exchanged for several hours after radar contact was lost. The calculations were independently performed and verified by the various members of the Investigation Team. The upgrade to the Inmarsat global aviation network that were necessary to record the timing information were made as the a direct result of enhancements that Inmarsat identified as desirable following the loss of Air France 447 in 2009.

ADS-C

Inmarsat provides position reporting data using Automatic Dependent Surveillance-Contract (ADS-C). ADS-C is a function on an aircraft that broadcasts position, altitude, vector and other information for use by air traffic control personnel for surveillance and by airlines for flight following purposes. The data is transmitted based on an explicit contract between an Air Navigation Service Provider (ANSP) and an aircraft. This contract may be a demand contract, a periodic contract, an event contract and/or an emergency contract. ADS-C is most often employed in the provision of Air Traffic Services (ATS) over transcontinental or transoceanic areas where other sources of surveillance are not available.

ADS-C provides active aircraft position tracking by transmitting the current position and the next two anticipated aircraft positions, as programmed into the aircraft's flight management system. It is this contract anticipated 'intent' feature of the ADS-C system that allows flight dispatchers and air traffic controllers to track an aircraft's progress and effectively manage the airspace.

ADS-C alerting

ADS-C position reporting rates can be adjusted to any prescribed time period, depending on the desired separation standard. This is not only important for operational safety, but is essential for delivering efficient routing using reduced separation standards. Importantly, ADS-C has inbuilt conformance monitoring that automatically alerts air traffic control personnel to any unauthorized altitude change or flight track deviation. The alerting and flight change reporting rates are conditions set up in the contract and are managed independent of the flight crew.

Global Flight Tracking (GFT)

As the Committee is aware, the International Civil Aviation Organization (ICAO), a specialized agency of the United Nations, codifies the principles and techniques of international air navigation. The ICAO Council adopts standards and recommended



practices concerning air navigation, its infrastructure, flight inspection, prevention of unlawful interference, and facilitation of border-crossing procedures for international civil aviation. ICAO defines the protocols for air accident investigation followed by transport safety authorities in countries signatory to the Convention on International Civil Aviation (Chicago Convention).

Inmarsat has both safety leadership and commercial interests in the recent announcements made by ICAO regarding the establishment of global flight tracking standards. As described above, Inmarsat uses ADS-C today to provide global commercial aircraft surveillance and flight following. In an effort to expand the use of this existing GFT technology, we are also supporting the first trial demonstration of the ICAO flight tracking standards, endorsed by the recently concluded High Level Safety Conference, with Airservices Australia and Qantas and Virgin Australia airlines. As part of this effort, the ADS-C flight tracking initiative was announced on March 1, 2015 by the Deputy Prime Minister of Australia.

We believe information collected from this trial could be used by aviation stakeholders, including ICAO, for the development of flight tracking concept of operations and standards.

ICAO GFT timeframes and solutions

Space-based ADS-C is an existing and reliable position reporting and aircraft tracking technology in use today by most oceanic commercial transport aircraft. It is a technically feasible and available solution that can readily meet the standards and timeframes proposed by ICAO in the near term by many of the world's aviation authorities.

Summary

Inmarsat is extremely proud of its safety contribution to aviation over the last several decades as well as to the current efforts to improve global aircraft tracking. We are investing heavily in future enhancements which will provide near real-time flight tracking capability and efficient management of the airspace. We believe we have an obligation to make a difference in global aviation safety and our safety legacy is not just based on commercial outcomes. To this end we have extended an offer of assistance to ICAO and other world bodies, to contribute to discussions and deliberations that would enhance global aviation safety standards. We believe the Committee can leverage this expertise in moving forward with legislation for the American public.

Thank you for the opportunity to provide this input to the Committee. We would also extend an open invitation for you, your staff, and any other interested parties to visit with Inmarsat and engage in more technically detailed discussions on this important policy issue.

Kind Regards,

Captain Mary McMillan

**For further information**

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About Inmarsat

Inmarsat plc is the leading provider of global mobile satellite communications services. Since 1979, Inmarsat has been providing reliable voice and high-speed data communications to governments, enterprises and other organizations, with a range of services that can be used on land, at sea or in the air. Inmarsat employs around 1,600 staff in more than 60 locations around the world, with a presence in the major ports and centres of commerce on every continent. Inmarsat is listed on the London Stock Exchange (LSE: ISAT.L). For more information, please visit www.inmarsat.com

The Inmarsat press release [newsfeed](#) is on Twitter @InmarsatGlobal

**NTSB Responses to Congressman David Price's
Questions for the Record
Hearing on Preventing Another MH370:
Setting International Standards for Airline Flight Tracking
February 25, 2015**

For reference, the NTSB's January 22, 2015, recommendations on airplane recovery are listed below.

Require that all aircraft used in extended overwater operations and operating under Title 14 *Code of Federal Regulations* (1) Part 121 or (2) Part 135 that are required to have a cockpit voice recorder and a flight data recorder, be equipped with a tamper-resistant method to broadcast to a ground station sufficient information to establish the location where an aircraft terminates flight as the result of an accident within 6 nautical miles of the point of impact. (A-15-1)

Require that all aircraft used in extended overwater operations and operating under Title 14 *Code of Federal Regulations* (1) Part 121 or (2) Part 135 that are required to have a cockpit voice recorder and a flight data recorder, be equipped with an airframe low frequency underwater locating device that will function for at least 90 days and that can be detected by equipment available on military, search and rescue, and salvage assets commonly used to search for and recover wreckage. (A-15-2)

Require that all newly manufactured aircraft used in extended overwater operations and operating under Title 14 *Code of Federal Regulations* (1) Part 121 or (2) Part 135 that are required to have a cockpit voice recorder and a flight data recorder, be equipped with a means to recover, at a minimum, mandatory flight data parameters; the means of recovery should not require underwater retrieval. Data should be captured from a triggering event until the end of the flight and for as long a time period before the triggering event as possible. (A-15-3)

Concurrent with the implementation of Safety Recommendations A-15-1 and A-15-3, coordinate with other international regulatory authorities and the International Civil Aviation Organization to harmonize the implementation of the requirements outlined in Safety Recommendations A-15-1 and A-15-3. (A-15-4)

Identify ways to incorporate adequate protections against disabling flight recorder systems on all existing transport category aircraft. (A-15-5) (Supersedes Safety Recommendation A-00-30)

Require that all newly manufactured transport category aircraft incorporate adequate protections against disabling flight recorder systems. (A-15-6) (Supersedes Safety Recommendation A-00-31)

Require that all existing aircraft operated under Title 14 *Code of Federal Regulations* (CFR) Part 121 or 135 and currently required to have a cockpit voice recorder and a flight data recorder be retrofitted with a crash-protected cockpit image recording system compliant with Technical Standard Order TSO-C176a, "Cockpit Image Recorder Equipment," TSO-C176a or equivalent. The cockpit image recorder should be equipped with an independent power source consistent

with that required for cockpit voice recorders in 14 CFR 25.1457. (A-15-7) (Supersedes Safety Recommendation A-00-30)

Require that all newly manufactured aircraft operated under Title 14 *Code of Federal Regulations* (CFR) Part 121 or 135 and required to have a cockpit voice recorder and a flight data recorder also be equipped with a crash-protected cockpit image recording system compliant with Technical Standard Order TSO-C176a, "Cockpit Image Recorder Equipment," or equivalent. The cockpit image recorder should be equipped with an independent power source consistent with that required for cockpit voice recorders in 14 CFR 25.1457. (A-15-8) (Supersedes Safety Recommendation A-00-31)

Question: Recent NTSB safety recommendations to the FAA call for deployment of a tamper-resistant method to locate a downed aircraft within 6 nautical miles (A-15-1), and identify deployable recorders and triggered data transmission (A-15-3) as two means of ensuring the recovery of flight data without underwater retrieval. Of all the technologies you looked at in crafting your recommendations -- from automatic distress tracking systems, to real time data streaming, to triggered data -- for both localization of the downed aircraft and flight data recovery, do any of these systems work *after* a crash has occurred? For example, does equipping aircraft with automatic tracking capability guarantee that it will provide the actual position of an aircraft after it goes down?

NTSB Response: In October 2014, the NTSB held the Emerging Flight Data and Locator Technology Forum to learn about technologies currently being utilized in the industry. Forum participants provided information on what was technically feasible at that time, which helped formulate the basis of the NTSB recommendations.

The technologies mentioned as examples in the NTSB recommendation letter are by no means comprehensive. In fact, the disappearance of Malaysian Airlines flight 370 has spurred high interest and rapid development in these areas. Deployable technology is one solution that would meet the intent of our recommendation, but with the speed at which technology develops and the amount of time required for implementing regulations, different, more advanced solutions will be available. For that reason, the recommendations do not prescribe a specific technology, but rather are performance-based to allow for the most effective and efficient solution

Question: ICAO's GADSS proposal includes the use of deployable recorders as a sort of "last line of defense" because they eject upon impact and float indefinitely, while also serving as a homing device for search and rescue officials, transmitting the location of the crash site, the aircraft tail number, country of origin, and the location of the floating black box itself. In crafting the NTSB recommendations, did you discover any other technologies that could provide this same post-crash capability?

NTSB Response: The NTSB believes the location of aircraft wreckage could be reasonably identified by implementing the first and second recommendations which address wreckage location and underwater location. The recommendations are purposely non-prescriptive to afford flexibility regarding how to meet the desired requirements. Deployable recorders could meet the intent on these recommendations, but other options will become available as more

research is done in this area.

Question: Do airlines that use "Real Time Data Streaming" transmit the same number of flight data and cockpit voice parameters that a standard or deployable black box is required to record for accident investigations? What happens to triggered data or real time streaming if on-board satellite equipment suddenly loses power, or if the aircraft loses its "lock" on the satellite?

NTSB Response: The NTSB is not aware of the data streaming capabilities of specific airlines, but generally, voice and image data are not currently transmitted. However, because there have been significant technological advancements in this area over the past decade and further advances are likely, capabilities are increasing and cost is decreasing.

Also, during our forum, we learned about a technology that transmits parametric data and the minimum flight data recorder parameters upon demand. Information was also presented in which an aircraft performed abnormal maneuvers and did not experience an interruption of satellite connectivity. As the regulator, the FAA is in the best position to ensure that implemented technology meets the intent of the recommendations, demonstrates appropriate robustness, and does not introduce any undesired consequences.

SEC. XX. IMPLEMENTATION OF NTSB RECOMMENDATIONS.

(a) COCKPIT VOICE RECORDER AND FLIGHT DATA RECORDER

REGULATIONS.—Not later than 120 days after the date of enactment of this Act, the Administrator of the Federal Aviation Administration shall initiate a rulemaking proceeding to require that—

1. all aircraft used in extended overwater operations and operating under parts 121 or 135 of title 14, Code of Federal Regulations, that are required to have a cockpit voice recorder and a flight data recorder, be equipped with—

(A) a tamper-resistant method to broadcast to a ground station sufficient information to establish the location where an aircraft terminates flight as the result of an accident within 6 nautical miles of the point of impact; and

(B) an airframe low frequency underwater locating device that will function for at least 90 days and that can be detected by equipment available on military, search and rescue, and salvage assets commonly used to search for and recover wreckage.

2. all newly manufactured aircraft used in extended overwater operations and operating under parts 121 or 135 of title 14, Code of Federal Regulations, that are required to have a cockpit voice recorder and a flight data recorder—

(A) be equipped with a means to recover, at a minimum, mandatory flight data parameters; the means of recovery should not require underwater retrieval; and

(B) have the capability to capture data—

(i) from the onset of a triggering event until the end of the flight; and

(ii) for as long a time period before the onset of the triggering event as possible.

(b) EFFECTIVE DATE OF REGULATIONS. Not later than 1 year after the date of enactment of this Act, the Administrator of the Federal Aviation Administration shall complete the rulemaking proceeding prescribed under subsection (a) and shall require that all aircraft comply with the requirements of the rulemaking no later than 6 months after the publication of the final regulations in Federal Register.

(c) HARMONIZATION. The Administrator of the Federal Aviation Administration shall coordinate with other international regulatory authorities and the International

Civil Aviation Organization to harmonize the implementation of the requirements established in the regulations issued in accordance with this section.



March 26, 2015

The Honorable David Price
House Committee on Oversight and Government Reform
2157 Rayburn House Office Building
Washington, DC 20515

Dear Congressman Price,

On behalf of the more than 250 members of the International Air Transport Association, I thank you for the opportunity to provide the global airline industry's perspective on the issue of international standards for flight tracking at the hearing held on February 25th.

As an outcome of that hearing, I am happy to provide the following responses to the questions you have submitted for the record:

Question 1: "Can you provide a sense of how many airlines are currently utilizing real-time data streaming?"

A significant proportion of commercial aircraft provide position data including latitude, longitude, altitude, and time. This requirement is currently met using a variety of means including voice reporting, Aircraft Communications Addressing and Reporting System (ACARS), Automatic Dependent Surveillance – Broadcast (ADS-B), Automatic Dependent Surveillance – Contract (ADS-C), and other technologies. In addition, many newer aircraft are equipped with satellite communications systems capable of transmitting voice and data from remote and oceanic airspace.

In terms of aircraft tracking (as opposed to simple position/location), we do not have any specific information on how many airlines currently utilize real-time streaming of data that would also be found on a flight data recorder. We believe a number of IATA member airlines are evaluating the capabilities of their fleet in this regard. However, the absence of any standards or recommended practices makes it difficult to project how or if they plan to implement this capability.

The MH370 tragedy has led to a global discussion on how to ensure complete situational awareness on any aircraft in flight. We will continue to work with the International Civil Aviation Organization (ICAO), the International Telecommunications Union (ITU), and others to determine the future role of data streaming in terms of aircraft tracking.

Question 2: "With regard to real-time data streaming, how large would the data stream need to be in order to make it wholly equivalent to the amount and type of data that is captured with a deployable recorder? What is the estimated monthly cost to airlines to stream that much data?"

There is no international standard or recommended practice for airlines to stream the equivalent data that would be collected by a conventional flight data recorder. We

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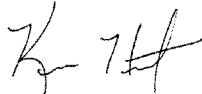
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anticipate that this level of data streaming would overwhelm worldwide commercial satellite capabilities. In addition, the infrastructure costs associated with supporting this streaming would likely far outweigh the benefits arising from this approach.

IATA continues to work with ICAO on the topic of aircraft tracking both in routine and non-routine situations. We understand that ICAO will soon be sending a letter to Member states on the subject of Automatic Deployable Flight Recorders. We look forward to providing comments to that letter. As I noted in my testimony, IATA remains concerned about the cost and efficiency of pursuing solutions that will likely become redundant in the short or longer term. Further, any airline-only solution ignores the shared responsibility for aircraft tracking between governments and industry. That being said, we would be pleased to continue to consult with the U.S. Congress as ICAO and the industry seek an effective and long-term solution to this problem.

I hope this information is helpful to you and am happy to answer any additional questions you or other members of the committee may have. I can be reached directly at (514) 874-0202 or via Mr. Douglas Lavin, IATA's Vice President for Member and External Relations - North America, at (202) 628-9292.

Sincerely,

A handwritten signature in black ink, appearing to read 'K. Hiatt', with a stylized flourish at the end.

Captain Kevin L. Hiatt, FRAeS
Senior Vice President,
Safety and Flight Operation

**Questions for the Record Submitted by
Representative David Price (1)
Ambassador Michael A. Lawson
House Committee on Oversight and Government Reform
February 25, 2015**

Question 1:

ICAOs Global Aeronautics Distress Safety System (GADSS) proposal calls for the deployment of a series of complimentary, performance-based technological capabilities, including deployable recorders, that together would ensure rapid location of downed aircraft and Black Box recovery. In addition to GADSS, is ICAO advancing a proposal for the use of automatic deployable flight recorders (ADFRs) as the second combination cockpit voice recorder/flight data recorder system under your current dual recorder standard? Can you provide me with an update on the progress of this proposal?

Answer:

ICAO has proposed Standards and Recommended Practices (SARPs) that would require either installation of one fixed combination recorder, a system to determine the location of an aircraft in distress, and one ADFR; or a combination of fixed recorders, a system to determine the location of an aircraft in distress, and a data streaming system.

In either case, timely delivery of data to accident investigators and redundancy of flight and voice data availability are provided, as well as means to accurately determine an accident location. The SARP and

associated guidance are in the drafting stage, and are expected to be disseminated to ICAO Member States by ICAO in April 2015 for comment. Final publication is expected in November 2016.

Question 2:

Do airlines that use “Real Time Data Streaming” transmit the same number of flight data and cockpit voice parameters that a standard or deployable black box is required to record for accident investigations? What happens to triggered data or real time streaming if on-board satellite equipment suddenly loses power, or if the aircraft loses its “lock” on the satellite?

Answer:

There is currently no regulatory requirement for installation of data streaming systems, and thus regulations do not list a required set of parameters that must be streamed. Likewise, operators who choose to install a data streaming system receive no regulatory credit. In other words, an operator may not substitute a data streaming system of any kind for a required flight data or cockpit voice recorder. Therefore, any loss of power to, or inability to transmit by, a voluntarily installed data streaming system will not diminish the availability of a full set of flight data to accident investigators. In the case of future requirements being considered by ICAO, a data streaming system will only be used in conjunction with fixed

combination recorders to ensure that failure of the data streaming system will not result in total loss of aircraft flight and voice data.

Question 3:

Since a performance-based approach will result in fleets of aircraft utilizing various differing technologies, has ICAO considered how that will impact search and rescue efforts? Would you expect international officials to have a record of what type of technology is on each aircraft in order to understand which technology or mechanism is being relied upon in the event of an incident?

Answer:

Search and Rescue (SAR) organizations are not directly notified by aircraft systems of an accident. They are contacted either by an operator or by a monitoring organization such as Cospas-Sarsat (a satellite-based search and distress alert detection and information distribution system). As such, the SAR organizations will be unaffected by any mix of aircraft systems used to report an accident. Operators are, and will continue to be, required to develop and implement SAR notification processes and procedures. Their process may, but is not required to, use third parties such as Cospas-Sarsat to notify SAR organizations on the operator's behalf.

Question 4:

Can you provide an estimate of the costs involved in the search operation currently under way for MH370 and other recently downed aircraft, including Air France 447 and Air Asia 8501? How would the FAA attribute these costs and consider them in conducting cost benefit analyses of potential aviation reforms?

Answer:

The search for Malaysia Airlines flight MH370 continues, and is a joint undertaking of several governments. Complete cost figures are not available, but in March 2014, the Government of Australia announced it will provide up to AUD \$89.9 million over two years from 2013-14 as part of Australia's contribution to the search for flight MH370. The U.S. contributed to earlier phases of the search by deploying underwater electronic sensing devices, a P-8A Poseidon anti-submarine and aerial reconnaissance aircraft, and two ships.

The BEA (Bureau d'Enquêtes et d'Analyses pour la sécurité de l'aviation civile), the French authority responsible for safety investigations into accidents or incidents in civil aviation, reports that €80 million was spent for Search and Rescue (SAR) efforts for Air France Flight 447. A further €27 million was spent for wreckage and flight recorders search and recovery.

In FAA calculations, the costs associated with search and rescue (S&R) for U.S. civilian aircraft would be included in the total cost of an accident. These costs would factor into the cost-benefit calculations of a proposed rule aimed at preventing further occurrences of an accident from causes associated with a given accident.

If a rule was proposed that did not aim to reduce the occurrence of an accident, but for the more narrow purpose of reducing S&R costs in the event of an accident (for example, by requiring tracking technology or by deploying recorders), FAA cost-benefit analysis would include calculations of the likelihood of an event requiring extensive S&R, and by how much the costs of S&R would be reduced by the provisions of the rule.